Vendors
Federal Business Opportunities

99--Naval Warfare Center and other NAVSEA field sites Engineering, Technical, and Support Services

General Information

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Description

This is an announcement of an upcoming solicitation. Currently, no information beyond this synopsis is available and no information or comments are requested from Industry based on this announcement. This synopsis is published to notify Industry that the Naval Surface Warfare Centers, Naval Undersea Warfare Centers, the Naval Sea Systems Command and all of their Field Activities are planning to solicit for Multiple Award Contracts for Engineering/Technical, and Programmatic Support Services. It is contemplated that the awarded contracts will have a five year base period, with two five year Award Term options for a total of 15 years performance. Indefinite Delivery/Indefinite Quantity contracts with Firm Fixed Price (FFP), Cost Plus Fixed Fee

(CPFF), Cost Plus Incentive Fee (CPIF), and Cost Plus Award Fee (CPAF) Delivery Orders are planned. Heavy emphasis will be placed on Performance Based Orders. Contracts will support all Divisions of the Naval Surface Warfare Centers, Naval Undersea Warfare Centers, the Naval Sea Systems Command and all of their Field Activities. A goal is to award approximately one third of the total obligated dollars of the contracts to small businesses. Large business awards must have a minimum Small Business Subcontracting Goal of 20%. The formal RFP announcement in the Federal Business Opportunities is anticipated to occur in mid October, with RFP release in mid December. Proposals will be required in late January 2004 and contract Awards are planned for early April 2004. An Electronic Industry Brief will be available at the time of RFP release, and an opportunity for Industry questions will also be identified in the RFP. A draft of the Statement of Work is currently available. The draft Statement of Work, Electr onic Industry Brief and RFP, when issued, will be available on the Naval Surface Warfare Center, Dahlgren Division Webpage at http://www.nswc.navy.mil/wwwDL/XD/SUPPLY/ . Download Statement of Work at http://www.nswc.navy.mil/wwwDL/XD/SUPPLY/solicita/04R4000/sow.doc

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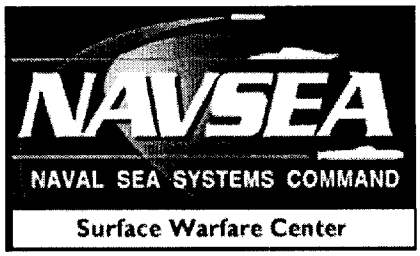
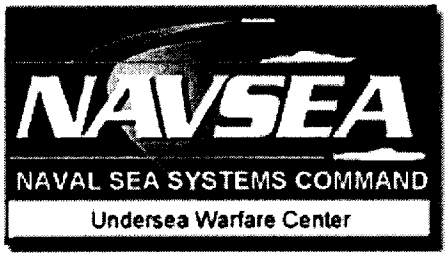
Additional Information

NSWCDD PROCUREMENT DIVISION Web Site - http://www.nswc.navy.mil/wwwDL/XD/SUPPLY/solicita/04r4000/4000syn.htm

STATEMENT OF WORK
FOR
NAVAL SEA SYSTEMS COMMAND WARFARE CENTERS
ENGINEERING, TECHNICAL, AND PROGRAMATIC SUPPORT SERVICES





"Keeping America's Navy #1 in the World"

30 September 2003
Version 1.4
Prepared by:
Naval Surface and Undersea Warfare Centers
Technical Requirements Group (TRG)

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LIST OF ACRONYMS IN SOW AND ATTACHMENTS	
A	
ADCAP	Advanced Capability
AER	Alteration Equivalent to Repair
AMSDL	Acquisition Management System and Data Requirements Control List
AOA	Analysis of Alternatives
ASROC	Antisubmarine Rocket
ASW	Antisubmarine Warfare
ATD	Advanced Technology Demonstrations
AUTEC	Atlantic Undersea Test and Evaluation Center
AVDS	Air Vehicle Diagnostic System
B	
C	
CAD	Cartridge Actuated Device
CAP	Combat Air Patrol
CASS	Consolidated Automated Support System
CBW	Chemical Biological Warfare
CDRL	Contract Data Requirements List
CM	Configuration Management
CMM	Capability Maturity Model
CNO	Chief of Naval Operations
COMOPTEVFOR	Commander Operational Test and Evaluation Force
COTS	Commercial Off-the-Shelf
CSSQT	Combat System Ships Qualification Trials
CV	Aircraft Carrier
CV/TSC	Carrier Based Tactical Support Center
C^3	Command, Control, and Communication
D	
DA	Design Agent
DEP	Distributed Engineering Plant
DID	Data Item Description
DoD	Department of Defense
DODISS	Department of Defense Index of Specifications and Standards
DOE	Department of Energy
DRMS	Defense Reutilization and Marketing Service
DT&E	Developmental Test And Evaluation
E	
EA	Electronic Attack
EC	Engineering Change
ECM	Electronic Countermeasures

ECS	Exterior Communications System
EM	Electromagnetic
EMCAP	Electromagnetic Compatibility Analysis Program
EMI	Electromagnetic Interference
EMV	Electromagnetic Vulnerability
EO	Electro-Optic
EOA	Early Operational Assessment
EOD	Explosive Ordnance Disposal
ESM	Electronic Surveillance Measures
EW	Electronic Warfare
EWBS	Expanded Work Breakdown Structure
E^3	Electromagnetic Environmental Effects
F	
FBM	Fleet Ballistic Missile
FCIM	Flexible Computer Integrated Manufacturing
FLEETEX	Fleet Exercise
FMS	Foreign Military Sales
FORACS	Fleet Operational Readiness Accuracy Check Site
FOT&E	Follow-on Operational Test and Evaluation
G	
H	
HAZMAT	Hazardous Materials
HERF	Hazards of Electromagnetic Radiation to Fuel
HERO	Hazards of Electromagnetic Radiation to Ordnance
HERP	Hazards of Electromagnetic Radiation to Personnel
HM&E	Hull, Mechanical and Electrical
HVAC	Heating, Ventilation, and Air Conditioning
I	
IA	Information Assurance
I & EW	Imaging And Electronic Warfare
ILS	Integrated Logistics Support
IMA	Intermediate Maintenance Activity
IR	Infrared
IR/IED	Independent Research and Independent Exploratory Development
IS	Information System
ISE	In-Service Engineering
ISEA	In-Service Engineering Agent
IT	Information Technology
IV&V	Independent Verification and Validation
IWAR	Integrated Warfare Assessment & Requirements
J	

JAHUMS	Joint Advanced Health and Usage Monitoring System
JATOS	Jet Assisted Takeoff Systems
JCALS	Joint Continuous Acquisition and Life-Cycle Support
JLOTS	Joint Logistics Over the Shore
JMA	Joint Mission Area
JWAL	Joint Warfare Assessment Laboratory
K	
L	
LAN	Local Area Network
LCAC	Landing Craft Air Cushion
LHA	Landing, Helicopter, Assault
LHD	Landing Helicopter Dock
LPD	Landing Platform Dock
LRIP	Low Rate Initial Production
LSA	Logistics Support Analysis
LSD	Landing Ship, Dock
M	
MACHALT	Machinery Alteration
MANTECH	Manufacturing Technology
MARAD	Maritime Administration
MCM	Mine Countermeasures
MCP	Mission Capability Package
MEMS	MicroElectro Mechanical Systems
MLI	Munitions List Items
MRTFB	Major Range and Test Facilities Base
MS&T	Measurement Science and Technology Laboratory
N	
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NDSTC	Naval Diving and Salvage Training Center
NEDU	Naval Experimental Diving Unit
NMCI	Navy Marine Corps Intranet
NOSSA	Naval Ordnance Safety and Security Activity
NSW	Naval Special Warfare
NSWC	Naval Surface Warfare Center
NUTEC	National UUV Test and Evaluation Center
NUWC	Naval Undersea Warfare Center
NVEO	Night Vision and Electro-Optics
O	

OESO	Ordnance Environmental Support Office
ONR	Office of Naval Research
OOTW	Operations Other Than War
OPEVAL	Operational Evaluation
OPNAV	Office of the Chief of Naval Operations
ORDALT	Ordnance Alteration
OSN	Office of the Secretary of the Navy
OT&E	Operational Test And Evaluation
P	
PAD	Propellant Actuated Device
PEO	Program Executive Officer
PHS&T	Packaging, Handling, Storage And Transportation
PM	Program Manager
PMO	Program Management Office
Q	
R	
R&D	Research and Development
RADAR	Radio Detection and Ranging
RDT&E	Research, Development, Test and Evaluation
RF	Radio Frequency
RFI	Ready For Issue
RM&A	Reliability, Maintainability, and Availability
RTASS	Remote Technical Assistance Support System
S	
S&T	Science and Technology
SDV	Swimmer Delivery Vehicle
SEAFAC	Southeast Alaska Acoustic Measurement Facility
SEI	Software Engineering Institute
SESE	Shipboard Electronic Systems Evaluation
SESEF	Shipboard Electronic Systems Evaluation Facility
SHIPALT	Ship Alteration
SI/SCI	Special Intelligence/Special Compartmented Intelligence
SLBM	Submarine Launched Ballistic Missile system
SOF	Special Operations Forces
SONAR	Sound Navigation and Ranging
SOW	Statement of Work
SPAWAR	Space and Naval Warfare Systems Command
SSA	Software Support Activity
SSBN	Nuclear Powered Ballistic Missile Submarine
SSEB	Source Selection Evaluation Board
SSGN	Nuclear Powered Cruise Missile Submarine
SSRNM	Surface Ship Radiated Noise Measurement
SUBSAFE	Submarine Safety Certification Program

SWS	Strategic Weapons Systems
T	
T&E	Test and Evaluation
TDA	Technical Direction Agent
TDP	Technical Data Package
TDKM	Technical Data Knowledge Management Program
TECHEVAL	Technical Evaluation
TEMP	Test and Evaluation Master Plan
TEMPALT	Temporary Alteration
TFR	Trouble Failure Report
TPM	Technical Program Management
TRP	Technology Reinvestment Project
TSC	Trade Security Controls
TSSE	Total Ship Systems Engineering
TTR	Tactical Training Range
TWCS	Tomahawk Weapons Control System
U	
UK	United Kingdom
UNREP	Underway Replenishment
UPS	Uninterruptible Power Supply
USA	United States Army
USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
USSOCOM	United States Special Operations Command
USW	Undersea Warfare
UUV	Unmanned Undersea Vehicle
UV	Ultraviolet
V	
VLS	Vertical Launch System
W	
WAN	Wide Area Network
WSAT	Weapons Safety Assistance Team
X	
Y	
Z	

1.0 SCOPE

1.1 Background

In 2002, the Chief of Naval Operations (CNO) promulgated *Seapower 21*. It provides a framework to align, organize and integrate the U.S. Navy to meet the wide variety of challenges that lie ahead. The CNO called upon the entire Navy, including Naval Sea Systems Command (NAVSEA) and the Warfare Centers (WCs), to find ways to become more efficient and effective. To meet *Seapower 21* objectives and to increase efficiency, the Naval Surface Warfare Center (NSWC) and the Naval Undersea Warfare Center (NUWC) have aligned to provide seamless integrated support for twelve core Product Area Directorates. The product areas are lead by Product Area Directors that notionally are very small planning and oversight offices. The day-to-day project management, planning, staffing and project execution will be provided by the geographically diverse NSWC and NUWC Divisions.

1.2 Product Area Directorates

The twelve core Product Areas are:

- Force Level Warfare Systems
- Ships and Ships Systems
- Surface Ship Combat Systems
- Littoral Warfare Systems
- Strategic Weapons Systems
- Ordnance
- Undersea Warfare (USW) Command and Control Systems
- Undersea Warfare (USW) Weapons and Vehicles
- Undersea Warfare (USW) Ranges, Analysis, and Assessment
- Undersea Warfare (USW) Fleet Material Readiness
- Homeland Security and Force Protection
- Surface Warfare Logistics and Maintenance

Attachment 1 to this Statement of Work (SOW) provides a detailed, in-depth description of the Product Area Directorates and the core equities associated with each. The NSWC and NUWC Division locations and the technical capabilities they provide in supporting the Product Areas are shown in Attachment 2 to this Statement of Work (SOW).

1.3 Scope of Contract

This SOW defines the overarching requirements for providing engineering, technical, and programmatic support services for the Warfare Centers. The Contractor shall, in response to task or delivery orders issued under this contract, provide services that potentially span the entire spectrum of product areas (as defined in Attachment 1 to this SOW) supported by the activities and technical capabilities that comprise the NSWC and NUWC (as defined in Attachment 2 to this SOW). Additionally, NSWC and NUWC may provide limited support under the contract to other Department of Defense (DoD), non-DoD, or Joint agencies for work that is integrally related to the Warfare Centers product areas and mission. Core equities within the product areas cover the range of technical skills over the entire life cycle of a warfighting capability including:

- Research, technology development, concept exploration, design and demonstration required to introduce transformational technologies into new or existing surface, undersea and strategic warfighting capabilities.
- Prototyping and fabrication.
- Test and evaluation.
- Certification, deployment, life cycle sustainment, operation and maintenance.
- Improvement, modernization, and overhaul.
- Demilitarization and disposal.

Additionally, services provided under this contract may include new product areas, programs, or missions assigned to these activities during the life of the contract.

2.0 APPLICABLE DOCUMENTS

Applicable military specifications and standards that are listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS), and current on the date of contract award, plus applicable industry standards, or any other program documents may be specified within the individual delivery orders that will be issued for performing specific tasks under this indefinite quantity contract.

3.0 REQUIREMENTS

The Contractor shall provide qualified personnel, materials, facilities, equipment, test instrumentation, data collection and analysis hardware and software and services that will support NSWC and NUWC, and their subordinate Divisions in the execution of their missions, product area directorates, and technical capabilities as described in ATTACHMENT 1 – Product Area Directorate Detailed Descriptions and in ATTACHMENT 2 – Warfare Center Activities Supporting Product Area Directorates. Functional areas to be supported under this contract are described in the sections below.

3.1 Research and Development Support

This functional area consists of supporting the development and application of scientific and analytical disciplines to conduct fundamental research; scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding; concept formulation; assessment of system and subsystem requirements; development, analysis and evaluation of concepts, technologies, systems and subsystems; and development of operational concepts and tactics with the end goal being the application of results to developing new or improving existing warfighting capabilities.

3.2 Engineering, System Engineering and Process Engineering Support

This functional area consists of supporting the application of engineering disciplines to technically support development of new warfighting capabilities and systems, technically support development of significant alterations to existing systems, support integration of existing equipment or software into different applications or platforms to support the warfighter, and support evaluation of foreign or non-developmental weapons systems, equipments, and technologies to satisfy existing warfighting requirements. Support is required for system and process engineering disciplines that systematically consider the requirements, synthesize and evaluate alternative concepts, identify a recommended selection, and generate a design and system specification.

3.3 Modeling, Simulation, Stimulation, and Analysis Support

This functional area consists of the application of a standardized, rigorous, structured methodology to create and validate a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. The functional area involves the use of models, including emulators, prototypes, simulators, and stimulators, either statically or over time, to develop data as a basis for making managerial, technical, strategic, or tactical decisions.

3.4 Prototyping, Pre-Production, Model-Making, and Fabrication Support

This functional area consists of the building, fabrication, testing, evaluating and operating reduced and full scale models, mock-ups, prototypes, pre-production units and research and development (R&D) test tools of electronic and electro-mechanical systems and system elements. Fabrication and machining of replacement parts or equipments for fielded systems or platforms is included. Includes the use of traditional materials as well as new composite materials.

3.5 System Design Documentation and Technical Data Support

This functional area involves the engineering effort required to prepare and assure that the detailed technical data documentation that is necessary to support system development reflects the latest design, configuration, integration, and installation concepts. Technical documentation may be in the form of paper, electronic (digital) or interactive computer systems.

3.6 Software Engineering, Development, Programming, and Network Support

This functional area consists of applying the engineering and scientific disciplines to perform technical analysis of, technically support development of or selection of hardware and computer software, or modification to existing hardware and software for systems, test facilities, or training facilities. This also consists of software engineering efforts and programming support required to technically support software implementation in systems, sub-systems, and components utilizing computers, electronics, and software. Planning, designing, coding, testing, integrating, supporting, and delivering algorithms, software (source code and executables), computer programs are the inherent activities of this functional area. Generally, the software development processes used for software development under this contract shall be, as a minimum, assessed at Software Engineering Institute (SEI) Capability Maturity Model (CMM) Level 3 or equivalent, however the Government may specify other (either lower or higher) standards in individual task orders issued under the contract.

3.7 Reliability, Maintainability, and Availability (RM&A) Support

This functional area consists of applying engineering, scientific, and analytical disciplines to ensure that systems and platforms RM&A requirements are integrated with the system design, development and life cycle sustainment resulting in warfighting capabilities that function effectively when required and that detection and correction of design deficiencies, weak parts, and workmanship defects that affect functionality are implemented.

3.8 Human Factors Engineering Support

This functional area consists of applying engineering, scientific, and analytical disciplines to ensure that design of interactive systems are safer, more secure and easier to use thereby reducing accidents due to human error, increasing system integrity and enabling more efficient process operations.

3.9 System Safety Engineering Support

This functional area consists of applying engineering and analytical disciplines to ensure that safety is considered in all aspects of design, development, operation, maintenance, and modification of systems and platforms.

3.10 Configuration Management (CM) Support

This functional area consists of applying engineering and analytical disciplines to identify, document, and verify the functional, performance, and physical characteristics of systems, to control changes and non-conformance, and to track actual configurations of systems and platforms.

3.11 Quality Assurance (QA) Support

This functional area consists of applying engineering and analytical disciplines to ensure that the processes and products used in the design, development, fabrication, manufacture of result in quality products.

3.12 Information System (IS) Development, Information Assurance (IA), and Information Technology (IT) Support

This functional area consists of providing information system software analysis, requirements definition, design, development, test, modification, installation, implementation, quality assurance, training, and documentation to meet the evolving data storage and reporting needs of programs and management. Analyze existing IT and IS databases, web sites, and IT applications and recommend new or improved interfaces and improved management tools that meet new management requirements, or improve management effectiveness and efficiency. Perform maintenance and technical support for Local Area Networks (LAN) and Wide Area Networks (WAN) that are outside the cognizance of the Navy Marine Corps Intranet (NMCI). Modify, implement and maintain web based information systems and links. Develop web-site structure, prepare documentation for population, implement and maintain web sites. Provide systems engineering and technical support for establishment, test, upgrade, and operational support of systems, networks, workstations and support equipment hardware and software that are outside the cognizance of NMCI. Conduct IA analyses, develop, recommend, and implement, monitor, update, and maintain, IA practices, procedures, equipments, algorithms, and hardware that are outside the cognizance of NMCI.

3.13 Ship Inactivation and Disposal Support

This functional area consists of technically supporting the submarine and ship inactivation and disposal program office to ensure that critical equipment removed is safeguarded and destroyed in accordance with the appropriate Navy instructions and directives. Provide direct liaison with the Shipyard and the NAVSEA program office to insure that critical technology is not inadvertently transferred to foreign nationals or governments. Ensure proper documentation exists for the sale of excess materials from inactivated ships prior to sale by the Defense Reutilization and Marketing Service (DRMS). Technically support the demilitarization process for shipboard equipment using the Expanded Work Breakdown Structure (EWBS), Trade Security Controls (TSC), and Munitions List Items (MLI) all of which are used to determine the disposition of excess, not-ready-for-issue (non-RFI) equipment. Technically support the security

classification requirements and guidelines for submarine and surface ship data and equipment necessary to assist in making decisions on sales issues.

3.14 Interoperability, Test and Evaluation, Trials Support

This functional area consists of the application of engineering, scientific, and analytical disciplines necessary to ensure that developed platforms, systems, and warfighting capabilities have been properly tested and that joint interoperability requirements have been fully met at all levels of their life cycle .

3.15 Measurement Facilities, Range, and Instrumentation Support

This functional area consists of applying engineering, analytical, and technician disciplines in the operation and support of measurement facilities, ranges and instrumentation used for testing, evaluating, experimenting, and exercising platforms and systems.

3.16 Acquisition Logistics Support

This functional area consists of applying the engineering and analytical disciplines required to implement acquisition logistics as a multi-functional technical management discipline associated with the design, development, test, production, fielding, sustainment, and improvement modifications of cost effective systems that achieve the warfighters' peacetime and wartime readiness requirements. The principal objectives of acquisition logistics are to ensure that support considerations are an integral part of the system's design requirements, that the system can be cost effectively supported through its life-cycle, and that the infrastructure elements necessary to the initial fielding and operational support of the system are identified and developed and acquired.

3.17 Supply and Provisioning Support

This functional area consists of applying the analytical and technical disciplines required to ensure that fielded warfighting capabilities are materially sustained. The principal objectives of this functional area is to ensure that material for fleet operation and maintenance of systems is available when required, that materials are properly stored and transported, and inventories are managed in a cost effective manner to sustain supported systems.

3.18 Training Support

This functional area consists of applying the engineering and analytical disciplines required to ensure that the warfighter and technical support community is provided with adequate instruction including applied exercises resulting in the attainment and retention of knowledge, skills, and attitudes regarding the platforms, systems, and warfighting capabilities they operate and maintain.

3.19 In-Service Engineering, Fleet Introduction, Installation and Checkout Support

This functional area consists of the application of engineering, analytical, and technical disciplines and skills to establish and maintain long term engineering, operation, and maintenance support for in-service warfighting capabilities as well as the capability to modernize or introduce transformational technologies into those capabilities.

3.20 Program Support

This functional area consists of applying the business, financial management, and technical disciplines required to support planning, organizing, staffing, controlling, and leading team efforts in managing acquisition programs such that the result places a capable and supportable system in the hands of the warfighter when and where it is needed, and does so at an affordable price. This functional area represents an integration of a complex system of differing but related functional disciplines that must work together to achieve program goals through development, production, deployment, operations, support, and disposal.

3.21 Administrative Support

This functional area consists of applying the clerical and administrative disciplines required for seamless operation of offices and support functions.

4.0 GOVERNMENT-FURNISHED PROPERTY

All Government furnished information, material, and equipment will be specified in the individual delivery orders. All government furnished information is the property of the U.S. Government and shall not be transferred to any individual or agency public or private without the express written approval of the originating contracting officer except as required for the specific performance of tasks under this contract.

5.0 SECURITY REQUIREMENTS

The work to be performed under this contract as delineated in the contract DD Form 254, involves access to, handling of, and generation of classified material up to and including SECRET. The Contractor shall appoint a Security Officer, who shall (1) be responsible for all security aspects of the work performed under this contract, (2) assure compliance with all DoD and U.S. Navy regulations regarding security, and (3) assure compliance with any written instructions from the Security Officers of the activity issuing delivery orders under this contract. In the event that any individual delivery order requires a higher level of clearance, a separate DD Form 254 will be prepared by the ordering activity and issued with the delivery order.

6.0 DATA DELIVERABLES

The attached Contract Data Requirements List (CDRL) DD Form 1423, Exhibit A, provides for delivery of a contract status report. Specific technical data will be ordered under CDRLs attached to individual delivery orders issued under the contract. It is anticipated that data items ordered under individual orders will be required to be prepared using standardized Data Item Descriptions (DIDs) listed in the DoD Acquisition Management System and Data Requirements Control List (AMSDL) current at the time of order issuance. After issuance of the first delivery order, CDRL Item A001 shall be delivered as specified in Exhibit A for the contract as a whole. It is anticipated that all deliverables prepared under this contract may be required to be delivered as either hardcopy and on electronic media or both as specified in the individual delivery orders.

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
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Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204. Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/Pr No. listed in Block E.

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP ____ TM ____ OTHER MGMT
	A	

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
Warfare Center Engineering Services Support		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	Status Report	Monthly Progress Report

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MGMT-80368	SOW PARA. 3.0	

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	D	MTHLY	SEE BLK 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N			SEE BLK 16

16. REMARKS

Blk 4: DID is cited for guidance only as to content. A brief letter in Contractor format that specifies the following for the contract as a whole – by delivery order identify costs expended, activities undertaken, progress toward completion, completion, unresolved issues, cumulative costs expended for the contract.

Blk 9: Distribution Limitation statements shall be placed on the document in accordance with Section H of the contract .

Blks 12,13: First submittal due at the end of the first complete month after issuance of the first delivery order. Subsequent submittals are due within 5 working days after the end of each month thereafter.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
NSWC COR	0	1	0
NUWC COR	0	1	0
PCO	0	1	0
15. TOTAL	0	2	0

17. PRICE GROUP

18 ESTIMATED TOTAL PRICE

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
W. T. Sawyer, NAVSEA Panama City Code A03	09/03/2003		

DD Form 1423-1, JUN 90 *Previous editions are obsolete*

ATTACHMENT 1

PRODUCT AREA DIRECTORATE DETAILED DESCRIPTIONS

1.0 Force Level Warfare Systems

This Product Area Directorate encompasses the following core equities:

- **Warfare Systems Analysis, Architecture, and Requirements** - Includes the capability to perform studies and analyses to provide definition, requirements, and cost and affordability assessment of warfare systems and force structures and their interoperability. These functions are performed at the battle group, force and theater levels, which includes joint and coalition forces. Included are formal (Analysis of Alternatives (AOA) like) and quick reaction special studies focused at the mission level. Integrally supports the technical aspects of the Office of the Chief of Naval Operations (OPNAV) Mission Capability Package (MCP) and Integrated Warfare Assessment & Requirements (IWAR) process. A significant portion of this core equity also provides for the definition, requirements, and metrics of Interoperability at the battle group, force, and theater levels including joint and coalition forces. Also, development of analysis tools including modeling and simulations and technology investigations. Provides the technical foundation for the development of architectures, requirements and options for future forces, new and upgraded weapons systems, and evaluation of impacts resulting from variations in threat and scenarios

- **Warfare Systems Engineering, Integration, Test and Evaluation (T&E) and Assessment** - Provides the ability to conduct warfare systems integration and integration assessment. This is conducted at the battle group, force, and theater level and provides force and battle group interoperability evaluation. It includes the development of mission level capabilities, test, evaluation and assessment of advanced systems and upgrades, and the capability to conduct and analyze battle group hardware-in-the-loop and operational testing (e.g. Distributed Engineering Plant (DEP) and Fleet Exercises (FLEETEXs)). Includes the development of joint capabilities and limitations documentation and the fielding, operation, and maintenance of resources required to collect data used in the assessment process. Results in improved battle group interoperability.

2.0 Ships and Ships Systems

This Product Area Directorate encompasses the following core equities:

- **Ship Integration and Design** - provides the capability to integrate multi-disciplinary technologies and systems into total ship designs and support analyses for surface ships, submarines, combatant craft, U.S. Marine Corps (USMC) and special warfare vehicles, and unmanned vehicles. Integrates across capabilities to provide a total system capability, technical depth and breadth, operational understanding, and a vision for producing effective and affordable naval and maritime ships and vehicles. Included are the engineering processes that cut across the ship and craft designs including total ship or vehicle design concepts, physics-based modeling

and simulation, cost and warfighting effectiveness, shipbuilding and manufacturing technologies, information systems, acquisition engineering, and advanced logistic concepts (e.g. JLOTS) and support systems. Supports the acquisition function of NAVSEA, Program Executive Officers (PEOs) and Program Managers (PMs), assures that the vehicle system is optimized across its subsystems, supports the early stage systems engineering process (especially pre-Milestone A), and provides support for AOAs and Cost and Warfighting Effectiveness Tradeoffs. It has primary impact on the execution capability for NAVSEA and the Warfare Centers to be smart buyers, acceptance certification for NAVSEA of design concepts proposed by industry, selection of high payoff and affordable ship technologies and systems to meet requirements, and to assure that systems are producible, and supportable throughout the life cycle.

- **Hull Forms & Propulsors** - Provides the capability to conduct hydrodynamic research, development, testing and evaluation for the US Navy and Maritime industries as required by Congress. Includes facilities and expertise to evaluate new concepts for vehicles and its propulsors, control surfaces and control systems, and propulsor interactions with the hull and the seaway environment. Also includes shipboard instrumentation and full-scale test capabilities as an integral component. Vehicles supported include surface ships, submarines, USMC and special warfare vehicles, boats and craft, and unmanned vehicles. Encompasses the Navy's only technical capability for hydrodynamic performance assessment and integrated development of surface, undersea, and amphibious vehicle hull forms and propulsors. Ensures that the performance of each platform meets mission requirements for mobility, controllability, sea keeping, and habitability. It has a primary impact on the safety, efficiency and affordability of platform operations, and contributes strongly to platform signature characteristics

- **Machinery Systems and Components** - Provides full spectrum capability (facilities and expertise) for research, development, design, test facilities, acquisition support, in-service engineering (including alterations), integrated logistic concepts, and life cycle support for Machinery Systems and Components. Supports all Navy ship classes and seaborne vehicles – aircraft carriers (CV class), surface combatants, auxiliaries, amphibious ships and vehicles, mine warfare and countermeasures ships, submarines, boats and craft including special warfare vehicles; and unmanned vehicles). Includes: machinery systems design and integration, mechanical and electrical power and propulsion systems; auxiliary machinery (including heating, ventilation, and air conditioning (HVAC) and collective protection) systems; hull, deck and habitability machinery (including underway replenishment (UNREP), and vehicle launch and recovery systems) systems; machinery automation, controls, sensors and network systems; alternative power sources; and sail and deployed systems. Provides these capabilities throughout the full lifecycle of individual ships or vehicles and across all ship or vehicle types. This breadth and depth insures that lessons learned will be propagated across all Navy ships or vehicles avoiding duplicative efforts and mistakes in design, acquisition, construction and support of those platforms. This core equity has a major impact on the performance, maintenance, safety and reliability of operation, and the affordability of the Navy ships and vehicles. It ensures that those vehicles meet performance and mission requirements for: mobility in all sea states; environmental compliance; habitability; and combat systems interfaces.

- **Structures and Materials** - Provides the Navy with specialized expertise for the full spectrum of research, development, design, testing, acquisition support, and in-service

engineering in the area of materials and structures. Applies to all types of materials and structures used in naval vehicles and their component systems, and results in the development and advancement of fundamental science, processing techniques, and fabrication methods. Support is provided for all surface ships, submarines, USMC and special warfare vehicles, boats and craft, and unmanned vehicles and their component systems. Focused on addressing the material and structural problems peculiar to naval vehicles such as very thick materials sections and large, complex structures, complex load profiles, corrosive environments, smart and multifunction applications, extended life times, and combinations of those requirements, which are not common to other military and civilian applications. Determines the safety and efficiency of operation, and affordability of naval platforms and their signatures and survivability. Contributes to the development of the technology, concepts, and procedures that enable manufacture of Navy ships and submarines and their component systems.

- **Environmental Quality Systems** - Provides the specialized expertise and facilities to design and engineer military mission compatible, efficient, and cost effective shipboard environmental systems, which minimize waste generation, eliminate the use of harmful chemical compounds, and destroy or appropriately treat wastes on board ship. Supports all Navy ships and craft, and related shore activities. Provides systems that meet the unique requirements of the warship environment (e.g. space, weight, stealth, noise, shock, logistics, manning, etc.) while still complying with the high environmental standards set forth in domestic and foreign laws and regulations. Adapts and integrates the latest commercial and university developed technologies and products into environmental systems for today's ships and those of the future. Ensures that Navy forces and activities can continue to perform their missions worldwide – without constraints imposed by environmental laws/regulations. Includes the ability to conduct peacetime transits of foreign territorial waters, and use of domestic and foreign port facilities.

- **Vulnerability and Survivability Systems** - Provides full spectrum capabilities for research, development, design, testing, acquisition support, and in-service engineering to reduce vulnerability and improve survivability. Platform products include: fire resistant and fire safe materials; damage control (including fire and smoke) systems and equipment, armor concepts; collective protection structural concepts and machinery systems; and ship control algorithms. Personnel safety products include equipment for: fire safety; ballistic, nuclear, biological, and chemical protection equipment and systems; and floatation and survival-at-sea. Functions provided include: shock and live fire trials; survivability and vulnerability analysis; weapons loading and effectiveness assessments; damage stability analysis; damage control systems integration; and damage control training. Supports all current and future Navy ships (including submarines, unmanned vehicles, USMC and special warfare vehicles, and boats and craft), their component systems, and their assigned personnel. The only Navy capability for ship vulnerability and survivability, and is required by the Navy in order to comply with congressionally mandated Live Fire Legislation. Ensures that Navy ships are safe to operate and have the lowest vulnerability and highest survivability possible. It achieves these goals by improving survivability against weapons, developing shock hardened, damage tolerant hulls and equipment, improving damage control and the ability to fight hurt, providing weight reduction, and enabling operation in shallow water in order to meet the changing threat.

- **Signature and Silencing Systems** - Provides full spectrum capabilities for research, development, design, testing, acquisition support, and in-service engineering for signature reduction and silencing. Signatures included are acoustic signatures, wake signatures; and the full spectrum of electromagnetic signatures—magnetic, electric, radar, infrared (IR), ultraviolet (UV), and optical. Functions and products include development of silencing requirements, silencing technologies, stealthy materials, and signature measurement equipment and systems; model tests and full-scale Fleet trials. Supports all Navy ship classes and seaborne vehicles – CVs, surface combatants, auxiliaries, amphibious ships and vehicles, mine warfare and countermeasures ships, submarines, boats and craft including special warfare vehicles; and unmanned vehicles. Is the Navy's single focused capability for signatures and silencing systems for naval vehicles. Achieves signature reduction and control objectives by addressing signatures at their source, reducing signatures before they are radiated, or impeding the return of threat sensor generated energy to its source (echo mitigation). Ensures all Navy ships have the lowest possible signatures that are cost effective and compatible with the ship's mission. Supports fleet units with: measurement and characterization of active and passive signatures; acquisition, reduction and analysis of ship signature data; development and optimization of signature reducing materials and their installation; identification and recommendation for correction of ship signature or silencing deficiencies; development of operational concepts intended to meet improved stealth requirements; and acquisition support for procurement of cost effective signature control systems for submarine and surface combatants.

3.0 Surface Ship Combat Systems

This Product Area Directorate encompasses the following core equities:

- **Air and Surface Surveillance and Detection Systems** - Provides the capability of providing life-cycle, multi-disciplinary support for the Navy's air and surface surveillance and detection systems. Encompassing the entire life-cycle from science and technology (S&T), concepts, development through retirement. Research, engineering design, systems engineering and integration, engineering maintenance, and full spectrum logistics support are applied. Supports Airborne and Surface Radar, High Vision and Electro-Optics Capability, including night vision, laser, low-light-level imaging, infrared (thermal), and highly stabilized multi-sensors systems. Efforts expended assure high levels of performance, reliability and training to attain maximum capability and operability in any environment.

- **Combat Control Systems** - Provides critical engineering, technical oversight, integrated logistics support, and facilities to support the acquisition and ownership for Combat Control Systems. Comprised of and supports the "control" element of the "plan-detect-control-act" sequence and includes the various systems and equipments used to display the tactical picture, make or assist making combat decisions, and direct control of the engagement systems. Typical functions associated with Combat Control Systems include sensor and track management, identification, combat air patrol (CAP) control, weapon assignment and control, threat evaluation, display, communications, kill assessment, and system readiness assessment and status. The impact of this core equity is that the critical government capabilities and the corporate knowledge base is applied to developing, adapting, and transitioning new technologies and advanced capabilities to the fleet to meet new threats and emerging needs in a

timely manner.

- **Engagement Systems** - Provides the S&T, design, development, manufacture, tactical, and integrated logistics support (ILS) life-cycle support for the Navy's Surface Warfare engagement systems. Included are the engineering processes and expertise that contribute to the systems engineering, test and evaluation of new concepts, modernizations, and upgrades, and integration into the ship's combat weapons systems. Supports engagement systems including missiles, launching and gun systems, simulators and trainers, weapons system test, diagnostic and training equipment. The combination of specialized expertise, unique highly classified threat and intelligence laboratories, and secure working environments provide a total system capability with the essential technical depth and operational understanding to support the current and future fleet needs. Provides assurance that the these systems will possess the capability to meet current and emerging threats, that the fleet will be provided the training and support to operate and maintain the systems, and that technical assistance will be available to solve complex fleet problems beyond the expertise of ships force or waterfront technicians.

- **Electronic Warfare** - Provides the capability to research, design, develop, acquire and provide life-cycle support for the Navy's Electronic Warfare systems. Encompasses and supports all surface shipboard electronic detection and guidance devices including electronic surveillance measures (ESM), electronic countermeasures (ECM) and electronic attack (EA). These assets are used against enemy forces to prevent or decrease the effectiveness of their efforts to use electronic detection and guidance devices against friendly forces. Provides essential knowledge, expertise, and equipments to maintain ships and systems in an environment safe from enemy threats so that they can complete their mission and functions.

- **Combat System Engineering, Integration, T&E, and Assessment** - Provides for the overall engineering, integration, test and evaluation and assessment of the Navy's Surface Warfare Combat Systems. Serves as the basis for the engineering, technical oversight, and facilities necessary to support acquisition and ownership of Combat Systems and the control of the interfaces across all ship combat system and warfare elements. The Combat System is comprised of all shipboard elements that execute the "plan-detect- control-act" sequence. The scope of support includes Combat Systems on all Navy combatant surface ships. Knowledge and expertise include system understanding of detection, tracking, identifying and display of enemy and friendly targets, the initialization, control and firing of weapons, the mid-course guidance and detonation of weapons and the kill evaluation. Results in fully integrated, tested, and operational Combat Systems, capable of interfacing with other ships or national assets, to provide the necessary support and fire power to meet the Navy's current and emerging threats and needs.

4.0 Littoral Warfare Systems

This Product Area Directorate encompasses the following core equities:

- **Mine Warfare Systems** - Provides the expertise and facilities for the full spectrum of S&T, Research, Development, Test and Evaluation (RDT&E), fleet support and in-service engineering mine and mine countermeasures systems. The mine efforts employ advanced sensor

and detection technologies to develop versatile and highly effective mines. The mine countermeasures (MCM) efforts exploit new technologies found in existing or emerging mine threats, and design and develop new systems and tactics to counter those threats. The systems use both dedicated and organic air, surface and sub-surface platforms as well as remotely controlled and unmanned systems. The dedicated assets include a wide variety of systems installed on the MHC and MCM ships and MH-53 helicopters as well as others on smaller craft. Includes organic minehunting systems that will be installed on surface combatants and a fully integrated organic minehunting and neutralization systems for the H-60 helicopters. Allows the Navy to conduct both offensive mine warfare to deny access to an area by enemy forces, and defensive mine warfare which is capable of detecting, identifying, and neutralizing mine threats from deep water through the surf zone.

- **Amphibious Warfare Systems** - Provides the expertise and facilities for the full spectrum of S&T, RDT&E, fleet support and in-service engineering for Amphibious Warfare Systems. Supports the warfare systems included on the amphibious platforms LHD, LSD, LHA, and LPD. Systems include ship and craft interface systems; command, control, and communication (C3) and navigation equipment; decision support systems, targeting sensors; battlespace information management systems; assault breaching systems; ship-to-shore transport systems and off-load systems. The highly specialized expertise applied in support of this core equity in conjunction with environmentally permitted test ranges forms a total system capability, technical depth and operational understanding. Amphibious Warfare, an integral part of Expeditionary Warfare, allows the capability to extend maneuver warfare from over-the-horizon, and is vital to the current and future warfare area plans.

- **Special Warfare Systems** - Provides the RDT&E, Acquisition Support and In-Service Engineering for the systems and equipment required to perform special mobility operations, unconventional warfare, coastal and riverine interdiction, beach and coastal reconnaissance and certain intelligence operations. Supports subsurface and surface mobility vehicles that can be manned, unmanned and remotely operated systems. Operations conducted using these systems are generally performed by Special Operations Forces and are accepted as being non-conventional in nature and clandestine in character. Contributes to international security, political stability, and economic progress, and plays an important role in U. S. maritime strategy defined in *Seapower 21*, particularly in littoral warfare, for national security purposes.

- **Diving and Life Support Systems** - Provides RDT&E, acquisition and in-service engineering support for the Navy's underwater and surface personal life support systems, and tri-service needs for all aspects of diving and personal life support requirements. Supports Naval Special Warfare, Explosive Ordnance Disposal, U.S. Marine Combat Swimmer, and Salvage Diving for in-theater ship repair. It also supports Life Support systems for manned operations in hazardous environments. The latter systems are needed for effective damage control and firefighting as well as providing protection and an operational capability in chemical and biological hazard scenarios and other extreme environments. Provides the capability for divers to conduct reconnaissance, recover ordnance, and repair damage. All of these are critical factors in maintaining the operational status of the deployed task force.

5.0 Strategic Weapons Systems

This Product Area Directorate encompasses the following core equities:

- **Targeting and Shipboard Subsystems** - Provides the engineering and technical oversight capabilities required to support the Navy strategic missile and re-entry systems. The Submarine Launched Ballistic Missile system (SLBM) is the primary focus supported by this core equity. Specific areas include fire control, targeting, launcher, and other shipboard subsystems. Supports the acquisition and ownership of the software and hardware needed shipboard and at U.S. Strategic Command for targeting and launching Navy Strategic systems. Through the capabilities and corporate knowledge inherent within this core equity new technologies and advanced capabilities are developed, adapted and transitioned to meet emerging strategic weapons system needs.

- **Missile and Re-entry Systems** - Provides the engineering, technical oversight, and facilities to support acquisition and ownership of Navy strategic missile and re-entry systems. Supports development of missile propellants and materials technology for SLBMs, and the assessment of the effects of nuclear environments on re-entry body performance. Includes support of the FBM Microelectronics Program, including component modeling, theoretical analysis, device development, and experimental analysis in both radiation and normal environments. A key element is the development and maintenance of unique design, performance, and test data for re-entry systems. Contributes to the government capability and corporate knowledge base for developing, adapting and transitioning new technologies and advanced capabilities to meet emerging strategic weapons system needs.

- **Weapons System Level Analysis, Testing and Evaluation** - Provides the capability to analyze, test, and evaluate systems which includes support of flight tests through both pre- and post-flight analysis, system accuracy and performance assessment in support of targeting, and management of problems reported by operational forces. Functions are provided for Navy Strategic systems and specifically the SLBM systems. Key products and services produced include Technical Program Management (TPM) requirements for acquisition and maintenance of SWS systems, evaluation of contractors and SSP field activities, and management of the TFR program. Provides the critical capability and corporate knowledge base to allow for effective development, adaptation and transitioning of new technologies and advanced capabilities to satisfy emerging strategic weapons system needs.

- **Non-nuclear Strategic Weapons Systems** - Provides the engineering, technical oversight, and facilities to support acquisition and ownership of the Navy's non-nuclear weapon systems deployed on strategic missiles or platforms or used in a strategic role. There is a growing role for such systems including on some of the SSBNs that will be converted to SSGNs, i.e. cruise missile platforms. Provides the critical capability and corporate knowledge base to allow for effective development, adaptation and transitioning of new technologies and advanced capabilities to satisfy emerging strategic weapons system needs.

6.0 Ordnance

This Product Area Directorate encompasses the following core equities:

- **Warheads, Rockets, Ammunition and Other Ordnance Systems** - Provides research, design, development, analysis, modeling, engineering, test, manufacture, acquisition, system integration, and industrial base, fleet and operational support. These functions are provided for energetic systems including Propellant Actuated Devices (PADs), aircrew escape propulsion systems, gun ammunition, rockets, missiles, Jet Assisted Takeoff Systems (JATOS), warheads, and other propellant or explosive filled ordnance. Much of the capability of this core equity has no or limited commercial equivalence, therefore it operates as a national resource for uniquely military requirements and problems. Results in safe, effective, and successful delivery and life cycle support including reliability and quality evaluation of energetic systems to meet operational requirements, and stewardship of an essential capability.

- **Energetic Materials** - Provides a full range of critical capabilities, to assure safe and effective energetic materials are available, including research and development (synthesis, formulations, test and analysis); advancement of state-of-the-art energetic chemicals, propellants, explosives and pyrotechnics; manufacturing technology; scale-up, prototyping and production; hands on manufacturing expertise; industrial base support; and weapons and system integration. These energetic materials are used for many applications such as Cartridge Actuated Devices (CADs), PADs, aircrew escape propulsion systems, gun ammunition, rockets, missiles, JATOs, pyrotechnic devices, specialty devices, and warheads as well as for torpedo fuels, propellants, explosives and pyrotechnics. This capability has no or very limited commercial equivalence, therefore it operates as a national resource for uniquely military requirements. Results in safe and effective energetic materials for use in ordnance and any military energetic system, as well as, the ability to anticipate and meet mobilization and surge requirements.

- **Ordnance Safety, Logistics and Environmental Technology** - Provides research, engineering, development, test and evaluation, supporting ordnance safety and ordnance environmental capabilities. The expertise, resources and facilities are applied to energetic materials such as energetic chemicals, propellants, explosives and pyrotechnics; and ordnance or energetic systems such as CADs, PADs, gun ammunition, rockets, missiles, JATOS, pyrotechnic devices, warheads and other ordnance related products. Some products and services are: recommendations for Navy policies and standards; explosive safety engineering; hazard classification, safer synthesis and manufacturing of new chemicals, pyrotechnics, explosives and propellants; training materials for certification of explosive operations personnel; investigation and analysis of explosive incidents and mishaps; evaluation, coordination and determination of critical environmental technology; and the packaging, handling, storage and transportation requirements and designs for Naval ordnance. Results in safer and environmentally friendly energetics and ordnance systems as well as the stewardship for the increasingly important technologies and capabilities supporting ordnance safety and environmental management.
- **Cartridge Actuated, Pyrotechnic, and Specialty Devices** - Provides the research, design, development, analysis, modeling, engineering, test, manufacture, acquisition, weapons and system integration, and industrial base, fleet and operational support. These functions are provided for specialty energetic devices including pyrotechnic devices, cartridge actuated

devices, explosive bolts, cutters, sounding devices and similar specialty devices. Much of this capability has no or very limited commercial equivalence, therefore it operates as a national resource for uniquely military requirements and problems. Results in safe, effective, and successful delivery and life cycle support including reliability and quality evaluation of specialty energetic systems to meet operational requirements, and stewardship of an essential capability.

7.0 Undersea Warfare (USW) Command and Control Systems

Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure undersea warfare combat systems readiness. Provides a full spectrum program of research, development and engineering committed to all acoustic elements of submarine combat systems with generally equal emphasis on technology base, advanced development, integration and assessment of: Active and passive detection, classification, tracking and localization capabilities; Acoustic communications capabilities; Hull-mounted and towed arrays; Special acoustic and environmental sensor capabilities. Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure submarine imaging and electronic warfare (I & EW) systems readiness. Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure submarine exterior communications systems (ECS) readiness. Provides corporate innovative scientific and sonar system engineering knowledge & facilities to meet fleet requirements for undersea warfare capabilities of surface forces. Provides end to end systems engineering of USW command and control across platforms, connectivity and cognitive tools to share data within the USW Battlespace and the theater level battlespace. This Product Area Directorate encompasses the following:

- **Submarine Combat Systems** - Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure undersea warfare combat systems readiness. Performs systems engineering, independent verification and validation (IV&V), and certification for integration of new and upgraded combat, command, and control subsystems into total combat systems. Performs analysis and evaluation of advanced technologies for transition to combat control systems to ensure an affordable evolution of compatible systems for fleet use. Ensures continuum of life cycle engineering support for Fleet, industry and academia toward development and maintenance of submarine USW combat systems. Ensures leadership for development and specification of combat system architecture and interface requirements, and demonstration of hardware, software, and systems performance & integration.

- **Submarine Sonar Systems** - Provides corporate scientific and engineering knowledge to all acoustic elements of submarine combat systems with generally equal emphasis on technology base, advanced development, full-scale development and in-service engineering support. Focuses on analysis, definition, development, integration and assessment of: Active and passive detection, classification, tracking and localization; Acoustic communications; Hull-mounted and towed arrays; and Special acoustic and environmental sensors. Determines system employment

guidelines and training systems development for operational realization of inherent capabilities of developed systems. Ensures full spectrum support for all transduction requirements of NUWC and serves as Navy's principal activity and center of expertise for acoustic transducer calibration, test, measurement and standards.

- **Submarine Imaging and Electronic Warfare** - Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure submarine imaging and electronic warfare (I & EW) systems readiness. Performs systems engineering, IV&V, and certification for integration of new and upgraded I & EW subsystems into submarine combat systems. Performs analysis, assessment, and evaluation of advanced technologies for transition to I & EW systems to ensure an affordable evolution of compatible systems for fleet USW use. Ensures life cycle support of submarine I & EW systems by performing in-service engineering of installed systems to ensure fleet readiness. Provides leadership for development and specification of submarine I & EW systems and interface requirements, and demonstration of hardware, software, and systems performance and integration.

- **Submarine Communications** - Provides corporate scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced engineering and operational systems development to ensure submarine exterior communications system (ECS) readiness. Performs systems engineering, IV&V, and certification for integration of new and upgraded communications subsystems and antennas into submarine combat systems. Performs analysis, assessments, and evaluation of advanced technologies for transition to ECS to ensure an affordable evolution of compatible systems for fleet USW use. Ensures continuum of life cycle engineering support for fleet, industry and academia toward development and maintenance of submarine ECS systems. Ensures leadership for development and specification of submarine ECS and interface requirements, and demonstration of hardware, software, and systems performance and integration.

- **Surface Undersea Warfare** - Provides corporate innovative scientific and sonar system engineering knowledge and facilities to meet fleet requirements for undersea warfare capabilities of surface forces. Conducts research, development, test and evaluation for advanced sensor systems that detect, classify, and localize current and projected submarine, torpedo, and mine threats. Provides leadership in the area of surface sonar systems through efforts involving performance analysis, mission effectiveness evaluation, notional systems design, architectural definition, computer-based modeling, simulation, hardware and software prototype development, assessments, at-sea testing, in-service engineering and operational support. Provides direct fleet interface and engineering support for surface sonar in-service systems and equipment, ILS management, supply, material, manufacturing and procurement support.

8.0 Undersea Warfare (USW) Weapons and Vehicles

Provides corporate and scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced development, and operational systems development for all submarine, surface ship, and air-launched torpedo systems. Provides expertise and specialized facilities in support of experimental vehicle technology base programs

to ensure technology insertion for Unmanned Undersea Vehicle (UUV) Systems. Provides capabilities required to establish techniques and identify transition technologies required to defeat an attacking torpedo. Provides technical leadership and management of submarine and assigned surface ship ASW weapon launching and handling systems. Provides corporate scientific and engineering knowledge and facilities for planning, developing, assessing, integrating, testing and operationally supporting USW tactical missile systems to ensure undersea warfare systems readiness.This Product Area Directorate encompasses the following:

- **Torpedoes** - Provides corporate and scientific and engineering knowledge and facilities for planning, developing, and conducting research, advanced development, and operational systems development for all submarine, surface ship, and air-launched torpedo systems. Performs systems engineering, design engineering, software engineering, logistics engineering and T&E for integration for new and upgraded torpedo systems into the Fleet. Identifies, develops, demonstrates and transitions new technology for torpedo systems. Ensures full spectrum of life cycle support engineering for fleet, industry and academia toward development and maintenance of torpedo systems.

- **Unmanned Undersea Vehicles** - Provides expertise and specialized facilities in support of experimental vehicle technology base programs to ensure technology insertion for unmanned undersea vehicle systems (UUVs). This role includes inventing, developing, integrating, demonstrating, and transitioning of UUV science and technology into the Fleet; provides technical program engineering and management dealing with life-cycle support for UUVs, undersea targets, countermeasures, and counterweapon systems.

- **Platform Defensive Systems** - Provide capabilities required to establish techniques and identify transition technologies required to defeat an attacking torpedo. These techniques encompass the torpedo detection, classification and localization and the effective combat control interfaces as well as the various devices and methods employed to defeat the threats. Achievement of self-defense goals requires the use of advanced signal processing (such as neural nets and wavelets), improved transducers (for both transmit and receive), adaptive processing and structured signal designs for countermeasures, the development of guidance and control algorithms and vehicle systems required to intercept high speed incoming targets, and novel concepts to defeat torpedoes that are within a few hundred yards of own ship.

- **USW Launchers** - Provides technical leadership and management of submarine and assigned surface ship ASW weapon launching and handling systems. Responsibilities include program/technical management of submarine and surface vessel weapon launching systems, exploratory development, advanced development, assessments, system analysis and simulation as required to define launcher systems and subsystems, requirements for development, operational systems development, testing cognizance and in-service engineering functions, system analysis and simulation required to define launcher systems and subsystems requirements for development. Responsibilities include integration of equipment and subsystems, maintenance, logistic support, quality assurance and production in conjunction with other government activities, private industry, universities and foreign activities as well as maintaining and operating extensive unique supporting laboratory facilities.

- **Submarine Missile Launcher Integration** - Provides corporate scientific and engineering knowledge and facilities for planning, developing, assessing, integrating, testing and operationally supporting USW tactical missile systems to ensure undersea warfare systems readiness. Performs systems engineering, design engineering, software engineering, logistics engineering and T&E for integration of new and existing missile systems on submarines. Analyzes and evaluates advanced technologies for transition to missile systems to ensure an affordable evolution of compatible systems for Fleet use. Ensures continuum of life cycle engineering support for Fleet, industry and academia toward development and maintenance of USW tactical missile systems. Ensures leadership for development of USW tactical missile systems and interface requirements, and demonstration of hardware, software, and systems performance and integration.

9.0 Undersea Warfare (USW) Ranges, Analysis, and Assessment

Provides corporate engineering and scientific knowledge and facilities for planning, developing, installing, and operating undersea ranges for US and allied USW training and test and evaluation. Provides a comprehensive undersea warfare analysis foundation that supports the conceptualization of current and emerging undersea warfare technological and operational directions. Provides comprehensive end-to-end USW readiness assessment, facilities, and training support to US and Allied foreign government undersea warfare research and development, Fleet tactical development, and readiness. This Product Area Directorate encompasses the following:

- **USW Ranges** - Provides corporate engineering and scientific knowledge and facilities for planning, developing, installing, and operating undersea ranges for United States and allied USW training and test and evaluation. Performs program management, systems engineering, requirements definition, algorithm and software development, ocean engineering, and acoustic, optical, and electronics technologies for training and T&E range development. Provides integration of live ranges with simulated and constructive exercises for undersea battlespace development to ensure affordable training and T&E options for the Fleet. Ensures leadership for development and specification of undersea ranges and engineering and T&E facilities.

- **USW Analysis** - Provides a comprehensive undersea warfare analysis foundation that supports the conceptualization of current and emerging undersea warfare technological and operational directions. Performs the analysis modeling and simulation of USW mission effectiveness required to assess submarine and surface ship USW including all aspects of warfare from under the sea and warfare against undersea threats including submarines, torpedoes and mines. Evaluates at-sea exercises through detailed reconstruction to explain system-level operations. Provides Science Advisors and technical support to the Fleet and Headquarters Commands. Performs technical analysis of intelligence information to assess implications for USW research and development.

- **USW Operational Assessment** - Provides comprehensive end-to-end USW readiness assessment, facilities, and training support to United States and Allied foreign government undersea warfare research and development, Fleet tactical development, and readiness assessment programs. Performs full spectrum test requirement development, production

acceptance, test planning, conduct, and performance assessment of major weapon systems, subsystems, and components at diverse facilities, in both real and simulated environments. Conducts comprehensive testing of ASW systems in the laboratory, dockside and underway, to ensure fully operational combat systems are delivered to the Fleet and to provide a continuing assessment of USW combat system material readiness. Establishes and provides Fleet tactical training methods and procedures to Fleet units. Provides leadership for the development and specification of the Undersea Battlespace, providing the ability to simulate the introduction of new and proposed systems to the warfighter in his environment. Conduct operational testing, and develop evaluation reports for operational test and evaluation agencies.

10.0 Undersea (USW) Fleet Material Readiness

Provides Fleet material support, modernization and industrial technology engineering with the objective of ensuring the highest quality Fleet material availability and readiness through repair, overhaul and engineering and logistics support for parts and systems. Provides unique and specialized industrial facilities and maintenance engineering necessary to ensure Fleet material readiness for undersea vehicles (torpedoes, targets, countermeasures and mines). Including capabilities for disassembly, cleaning, module and components overhaul, upgrade and repair, assembly, fueling, ordnance handling, testing and environmental control of hazardous operations. Provides light industrial technology engineering and shop capabilities (machining, plating, painting, powder coasting and electronic or electrical fabrication) for maintenance technology development, rapid prototyping, and custom engineering and fabrication solutions to resolve critical Fleet material needs due to obsolescence systems or components, lost sources of repair, or Original Equipment Manufacturer (OEM) "bail-outs". This Product Area Directorate encompasses the following:

- **USW Depot -** Provides Fleet material maintenance technology engineering and industrial capabilities required to ensure highest Fleet material availability, reliability, and sustainability. Provides unique engineering and industrial support of Fleet undersea vehicles including all Depot and Intermediate Maintenance Activity (IMA) processes for upgrades and turnarounds for all US Navy torpedoes (MK46, MK50, MK48, and MK54); troubleshooting, field change installation and repairs on all target systems; preparation of Ready for Issue (RFI) MK30 Targets; removal, disassembly, repair, reassembly, testing, and installation of 5" and 6" countermeasures; overhaul, repair, and assembly of undersea weapons delivery systems and Fleet training system such as submarine and surface ship torpedo launch systems and Antisubmarine Rocket (ASROC) Vertical Launch System (VLS); and overhaul or repair and industrial support to US Navy undersea mine program such as the Quickstrike Mine assemblies and AN/SQQ-32 Mine Hunting Sonar Systems. Provide overhaul and repair of Navy electronic modules and systems, electro-mechanical devices, and mechanical systems.

- **Obsolescence Engineering Solutions -** Provides maintenance technology development, rapid prototyping, precision COTS insertion, and custom engineering and fabrication solutions to resolve critical Fleet material needs due to systems obsolescence, unavailable or inadequate engineering documentation, or "lack of response" from Original Equipment Manufacture (OEM) or lost sources of repair. Provide emergent overhaul or repair and low-quantity manufacturing of defense electronic modules and systems, electro-mechanical devices, and mechanical systems.

11.0 Homeland Security and Force Protection

This Product Area Directorate encompasses the following core equities:

- **Homeland Security and Measured Response Options** - Provides a technical and systems engineering integration of capabilities in support of current and future homeland security requirements. Provides support to the homeland security components of homeland defense and support to civilian authorities to include coastal security, critical infrastructure protection, and counter-drug applications. Allows for preparation, prevention, deterrence, defense and response from asymmetric threats to non-military targets, both home and abroad. Additionally, provides non-traditional measures to counter these threats with operationally relevant measured response option that enable forces to optimize their effectiveness in operations other than war while preserving their ability to fight and win. NSWC's Naval Operations Other Than War Technology Center, The Joint Program Office for Special Technology Countermeasures and Critical Infrastructure Protection, and the DoD Counterdrug Technology Development Program are integral parts of this core equity.

- **Force Protection, Chemical and Biological Defense Systems** - Provides leadership, concept generation, and products to prevent or mitigate terrorist actions against DoD personnel, resources, facilities, and critical information to include physical security, operations security, and personal protective services. Supports combating terrorism activities and missions (both anti-terrorism and counter-terrorism) with the objectives of reducing the vulnerability to terrorist acts and developing offensive measures designed to prevent, deter, and respond to terrorism. Addresses consequence management, crisis management and intelligence support taken to oppose terrorist threats including chemical and biological attacks. The Navy's lead in chemical and biological defense systems and addresses the technology base, threat analysis and full spectrum of engineering expertise necessary to develop collective protection systems designs, to develop and test standoff and point detection options, decontamination solutions and techniques, and modeling and simulation.

- **Mission Assurance Capabilities** - Provides the ability to identify critical infrastructure susceptibilities and operational dependencies that, if not assured, could adversely impact mission success, or continuity of operations. Includes physical and logical infrastructure modeling (of commercial and defense networks), asset-to-mission dependency analysis, mission readiness and assurance assessments, risk-based management solutions, data mining and information management. This support is provided to mission planners, regional and installation commanders, and the warfighter as well as decision makers within the defense industrial base and/or acquisition community. Critical Infrastructure Protection and Mission Assurance initiatives have lead the way by developing and standardizing the methodologies and analytic capabilities to support the warfighter and civilian planners.

12.0 Surface Warfare Logistics and Maintenance

This Product Area Directorate encompasses the following core equities:

- **Performance Based Logistics**
- **Maintenance Engineering**
- **Fleet Material Management**

ATTACHMENT 2

Warfare Center Activities Supporting Product Area Directorates

A. NAVAL SURFACE WARFARE CENTER (NSWC)

NSWC is the full-spectrum research, development, test and evaluation, engineering, and Fleet support center for surface ship hull, mechanical and electrical systems, surface ship combat systems, coastal warfare systems, and other offensive and defensive systems associated with surface warfare. The Center is comprised of six Divisions located across the country.

1.0 The Carderock Division

The Carderock Division, located in West Bethesda, MD (Navy Region National Capital), has the mission of : (a) being the U.S. Navy's principal activity for RDT&E, fleet support, and in-service engineering for surface and undersea vehicle hull, mechanical, and electrical (HM&E) systems and propulsors; (b) providing logistics research and development; and (c) supporting the Maritime Administration (MARAD) and maritime industry. The Carderock Divisions mission covers all aspects of surface ship and submarine hull mechanical and electrical systems (HM&E) across all life cycles. The Carderock Division addresses the full spectrum of applied maritime science and technology, from the theoretical and conceptual, through design and acquisition, to implementation and follow-on engineering. The Carderock Division is comprised of two major sites - Headquarters, West Bethesda, MD, and Ship Systems Engineering Station, Philadelphia, PA - and other facilities listed in Section 1.1 of this attachment. Additional information on the Carderock Division is available at http://www.dt.navy.mil/). The Carderock Division technical capabilities are:

- **Ship Design and Integration** - Carderock Division possesses naval architectural and integrated surface ship, and submarine design analyses capability to support ship systems integrated designs for acquisition programs and to generate advanced concepts ship designs for future naval capabilities. The capability for naval architectural integration at the ship systems level (total ship systems engineering) is unique to Carderock Division among all NAVSEA field activities. This function involves integration of the hull, mechanical and electrical (HM&E) systems technologies developed throughout Carderock Division, as well as those from other NSWC Divisions. Carderock Division serves as the naval architectural total ship systems engineering agent for NAVSEA Headquarters and other customers requiring this capability within an in-house Navy organization.

- **Ship Acquisition Engineering** - Provide single point-of-contact liaison between the Program Offices and Lead Design Yards and the technical codes at the Carderock Division. Provide the single point of entry for most program funding to assure value added to the customer and a coordinated Division response to customer needs. Provide consolidated proposals, reporting, tasking, and programmatic guidance to the Division technical codes. Provide the engineering and technical expertise to support headquarters acquisition Program Offices throughout each stage of the life cycle. Perform functions of Ship Design Manager, Deputy Ship Design Manager, and Systems Engineering Manager in support of NAVSEA 05 and acquisition

program offices.

- **Ship Systems Concepts, Technologies, and Processes** - Provide the development, application, and advocacy of advanced concepts, technologies, and processes to support Total Ship Systems Engineering (TSSE). The following areas are included: information, software, and hardware integration and interoperability associated with ship design; information technology for ship life cycle support and other Navy needs; shipbuilding process improvements, product data acquisition, development, management, distribution, and use; ship costing, manpower, warfare assessment, and early stage design tool development and application; and development and application of collaborative teaming tools and environments.

- **Surface & Undersea Vehicle Machinery Systems Integration** - This technical capability provides a coordinated, integrated approach for all major machinery programs. This role includes test and evaluation initiatives, enabling technology insertion, and machinery integration into new acquisition programs and the deployment of machinery initiatives into the Fleet. In addition this role provides platform specific focus for the management of machinery systems for the PEO and all Fleet activities. The platform role includes the management of planned tasks, unplanned tasks, business development and information and product management. The program role includes the initiation, planning, execution and management of all major machinery programs. Programs are determined from the risk, visibility and integration of the specific tasks or projects. In addition this capability provides an integrated approach to systems engineering for machinery system that require focus from multiple technical capabilities. The role includes the management of well disciplined processes for the management of programs and platforms. This technical capability provides the primary interface to external customers for machinery system initiatives. This role manages machinery proposals and products. This capability provides extensive analyses of external and internal trends, matching engineering and support codes to our customers needs.

- **Combatant Craft & USMC Vehicles** - This technical capability is the core of the government's Combatant Craft and Boat experience and technical expertise and USMC Vehicles. The synergistic integration of full spectrum, full life cycle boat and craft expertise and experience near the boat and craft Fleet provides for unique capabilities. The technical capabilities primary purpose is to provide the integration of all aspects of boat, craft and vehicle development. This capability addresses vehicles with all types of hull forms and mission requirements from unpowered, towed craft to high speed vehicles with dynamic as well as buoyant lift. This capability supports the changing needs of a broad customer base: including the U.S. Navy, U.S. Army (USA), USMC, Special Operations Forces (SOF), U.S. Coast Guard (USCG), Foreign Military Sales (FMS) and other DoD, non-DoD and private industry sponsors.

- **Unmanned Vehicles** - Provide the science, technology, and engineering expertise for the development of advanced concepts for surface, subsurface, air, and ground unmanned or autonomous vehicles and their integration with existing and future manned naval and USMC units. Provide the HM&E expertise (in conjunction with other Carderock capabilities) for launch and recovery systems, propulsion systems, and battery and advanced energy sources. Provide the integration of all aspects of maritime unmanned vehicle development, testing, fielding, and

support.

- **Hull Forms, Propulsors, and Fluid Mechanics** - This is the Navy's only technical capability for surface and undersea vehicle platforms, propulsors, and fluid mechanics. It supports all marine vehicles including surface ships, submarines, unmanned vehicles, and craft (including fixed and rotating wing aircraft) by developing the technologies for systems and procedures which define the external shape of the vehicle, control systems and control surfaces, and the vehicle's propulsor interaction with the vehicle and its environment. These systems are necessary to ensure that the performance of each platform meets mission requirements for controllability, powering, mobility, seakeeping, and propeller or foil noise. These characteristics to a large part determine the safety, efficiency and affordability of the platform operation, and contribute to its signature characteristics. This capability addresses vehicles with all types of hull forms and mission requirements from unpowered, towed vehicles to high speed vehicles with dynamic as well as buoyant lift. The Division provides the required, extensive and highly specialized model testing facilities necessary to fully support sponsors, and to develop and validate analytical tools used to design or assess alternatives to meet Navy requirements.

- **Surface and Undersea Vehicle Mechanical Power and Propulsion Systems** - These are the engines (non-nuclear), reduction gears, shafting, bearings and associated mechanical components, which provide mobility, range, and endurance to surface ships, submarines and craft. Specific items within this technical capability include gas turbine, internal combustion, and steam power systems, equipment, and components; main propulsion reduction gears, clutches, brakes, couplings, thrust bearings, shafting components, and propulsors. Principal functions performed are the research and development, test and evaluation, and life cycle management of mechanical power and propulsion systems and equipment.

- **Surface and Undersea Vehicle Electrical Power and Propulsion Systems** - These are the electrical power and propulsion generation, conversion and distribution systems for surface ships, submarines and craft. Specific items within this technical capability include electric power and propulsion generators and motors, current collectors, switch gear, power conditioning devices and equipment, and electric distribution systems and equipment. Principal functions performed are the research and development, test and evaluation, and life cycle management of electrical power and propulsion systems and equipment.

- **Surface and Undersea Vehicle Auxiliary Machinery Systems** - These are the critical infrastructure systems and equipment that support all aspects of operation such as propulsion, power generation, combat systems, life support, weapons, acoustics, depth, and maintenance for surface ships, submarines and craft. Specific items within this technical capability include pumps, air compressors, hydraulics, piping and valves, actuators, distillation plants, oxygen generators, heat exchangers and cooling systems and equipment. Principal functions performed are the research and development, test and evaluation, and life cycle management of auxiliary machinery systems and equipment.

- **Surface and Undersea Vehicle Hull, Deck, and Habitability Machinery Systems** - These are the systems and equipment which provide the intra-ship materiel and weapons handling, boat, vehicle and aircraft handling, navigation, closures and habitability and hotel

service systems. These systems and components are vital to shipboard operation to make the ship ready to support battle condition requirements as well as to sustain the ship when deployed. Specific items within this technical capability include: anchor windlasses, boat davits, conveyors, cranes, elevators (aircraft, cargo, weapons, and personnel), escalators, hoists, submarine hydraulics, torpedo handling, minesweeping handling, steering, helicopter hangar doors, life lines, safety nets, doors, hatches, scuttles, food service, galley, laundry and dry cleaning, lavatories and berthing equipment. Principal functions performed are the research and development, test and evaluation, and life cycle management of hull, deck and habitability machinery systems and equipment.

- **Surface and Undersea Vehicle Machinery Automation, Controls, Sensors and Network Systems** - These are the devices, systems, applications, connectivity, and interfaces that provide the enabling smart-ship driven digital technologies and programs. Functions include performance detection and monitoring, control, unmanned operation, and distribution of information for machinery systems and components. They enable situational awareness, fault detection and corrective action, intelligent reconfiguration and redistribution of vital systems, and the reduction of human involvement in machinery operation and decision making tasks. These systems are utilized by all other machinery technical capabilities, and support the effective operation and maintenance of these systems and equipment. Principal functions performed are the research and development, test and evaluation, in service engineering, software support, and life cycle management of machinery automation, controls, sensors and network communications systems and equipment.

- **Surface, Undersea and Weapon Vehicle Materials** - RDT&E, acquisition support, and In-Service Engineering Agent (ISEA) for surface, undersea and weapon vehicle materials. Certifying and validating technical requirements for all materials used in the Fleet. Supporting Navy safety standards. Identifying materials and fabrication processes. Analyzing engineering mechanics and fitness for purpose. Developing and validating chemical formulations; and metallic and non-metallic tests and characterizations. Fabricating and testing prototypes of ship systems and components. Developing materials and processes for survivability systems, sea borne signature reduction, ship structures, weapons, and propulsion and auxiliary machinery systems.

- **Surface and Undersea Vehicle Structures** - Full spectrum RDT&E, acquisition support and ISEA for surface ship and submarine structures. Identifying new structural concepts and materials applications; identifying potential failure modes; developing and validating methods to predict seaway, ice-breaking, and other loads; developing and validating structural analyses and design procedures; proven analytical and experimental procedures to support ship design; confirming designs through analyses, model tests, sea trial, and deep dives; and ISEA support.

- **Alternative Energy & Power Sources R&D** - The core technical expertise to investigate, develop and implement programs in emerging alternative energy source technologies. This technical capability combines the strengths of the Navy's recognized leaders in electrochemical power sources (e.g. batteries & fuel cells) R&D, and leadership in marinization and ship integration with other disciplines such as nuclear technologies, biotechnology, physics, materials science, and shipboard electric power systems enabling the

development of energy source specifications, which effectively address safety and environmental issues as well as performance requirements. As a result, application of this capability accelerates the transition of advanced technology to application in current and future Navy systems.

- **Environmental Quality Science and Systems** - The core technical expertise necessary to equip Navy ships with environmental quality procedures, equipment, and systems that are best suited and designed to meet the unique requirements within the constraints of the warship environment (e.g., environmental compliance, space, weight, stealth, noise, logistics, manning, etc.). This capability provides the body of knowledge to sustain stewardship of environmental quality systems throughout their life cycle; ensures independent and objective testing, validation and integration of products; and provides teaming and partnering with industry and academia to ensure technological superiority for the future Fleet's war fighting systems.

- **Advanced Logistics Concepts and HM&E Life Cycle Logistics Support** - The core technical expertise for logistics support technology and developing and maintaining ILS products for all HM&E equipment and systems in the Fleet and for Army watercraft. Products and Services include: Concept development, R&D, T&E, Modeling & Simulation, Cost and Benefit Analyses, Designs & Specifications Hardware, Technology Transition, Knowledge and Technical Base, and Management Support. Specific Areas of expertise and programs include: Life Cycle Engineering, Logistics Technical Documentation, Logistics Information Technology, Condition-Based Maintenance (includes aviation platforms – Joint Advanced Health and Usage Monitoring System (JAHUMS) & Air Vehicle Diagnostic System (AVDS) programs), Navy Joint Continuous Acquisition and Life-Cycle Support (JCALS) Implementation, Strategic Sealift & JLOTS, Logistics Systems Analyses & Modeling, Offshore Basing, Materiel Support & Automated Prognostics Maintenance. Provides Navy-wide logistics R&D, and RDT&E, Fleet Support, and In-Service Engineering for Fleet HM&E Logistics Systems (including ordnance, material, boat and vehicle handling systems), ensuring mission sustainability where and when needed. Examines development and application of technologies pertinent to transportation and transfer of personnel and material; maintenance, diagnostics, and repair of surface and subsurface vessels and marine vehicle systems; development and maintenance of logistics technical documentation for HM&E systems; digital Logistics data environments, and Integrated Logistics Support planning, management and implementation.

- **Surface, Undersea and USMC Vehicle Vulnerability, Survivability and Force Protection Systems** - NSWC ship (including submarine, unmanned vehicles, USMC vehicles, and boats and craft) vulnerability, survivability and force protection products are the technology, equipment and systems necessary to ensure that all Navy ships are safe to operate and have the lowest vulnerability and highest survivability possible. These products apply to personnel, and the platform and its component systems. Functions performed include the full spectrum of RDT&E, acquisition support, and ISEA for new ship and submarine designs, and for alterations to current vehicles. Ship products include: damage tolerant hull forms and structural concepts; fire resistant and fire safe materials; damage control (including fire and smoke) systems and equipment; shock hardened hulls, machinery, and equipment; damage resistant structures (including armor concepts); collective protection structural concepts and machinery systems; ship control algorithms; shock and live fire trials; survivability and vulnerability analyses; weapon loading and effectiveness assessments; damage stability analyses; damage control

systems integration; damage control training; and personnel safety products (equipment for: fire safety; ballistic, nuclear, biological, and chemical protection systems; and floatation and survival-at-sea).

- **Surface and Undersea Vehicle Active and Passive Acoustic Signatures and Silencing Systems** - Develops technologies and methodologies employing stealth concepts to reduce ship (also submarine, unmanned vehicle, and craft) signatures. Silencing concepts and products develop from mission requirements factored with existing technology and materials, and cost considerations. In their primarily military application, the products reduce the signature at its source, reduce the signature before it is radiated, or impede the return of threat sensor energy to its source (echo mitigation). All ships, submarines, boats, craft and unmanned vehicles: silencing approaches, materials, hardware and machinery to reduce ships signatures; research in radiated noise, structureborne noise, structural acoustics, SONAR-self-noise, propulsor noise, acoustic materials, machinery noise, active noise control, and synergistic concept integration for future quiet ships and submarines with increased tactical missions envelopes; acoustic measurements facilities, equipment and techniques; recommendations to reduce the passive acoustic signatures, and SONAR-self noise of ships and submarines; RDT&E on target strength mechanisms, the relationship of marine structures to target echo structure, the mitigation of target echo by passive means through structural design and echo reducing materials suitable for marine applications; precision active acoustic measurements and data reduction, analyses, and interpretation on full-scale and large models; measurements of radiated noise, structureborne noise, structural acoustics, SONAR-self noise, propulsor noise and machinery noise systems; and integrated structural and material echo reduction concepts for the design of future quiet submarines with increased tactical mission envelopes.

- **Surface and Undersea Vehicle Non-Acoustic Signatures and Silencing Systems** - Develops technologies and methodologies to reduce ships' (including submarine, unmanned vehicle, and craft) radar cross section, infrared, electro-optical, and magnetic signatures. Measurement and diagnostic systems and modeling consider mission in a cost-effective, integrated signature control design. Existing systems are evaluated and design changes are recommended. In-service engineering includes developing design of system backfits as new technology becomes available. All Ships, Submarines, boats, craft and unmanned vehicles: policy for future R&D and the direction of stealth development and design; Program management for the Topside Signature portion of the Surface Ship Exploratory Development Program; system and component performance technical requirements; signature assessments of existing surface ships and undersea vehicles; non-acoustic signature predictions of notional vessels; design change recommendations to mitigate non-acoustic signatures of existing and future ships; advanced electromagnetic signature theories; formulations, manufacturing processes and measurement techniques for low-observable materials, coatings, and equipment; computational modeling and analyses; model experiments, and full-scale trials; non-acoustic signature reduction system and component sea trials on a dedicated test craft; system designs for backfits, new construction, and countermeasures; and Fleet support.

- **Undersea Vehicle Sail Systems and Deployed Systems** - These are the submarine sail and deployed systems used to communicate, navigate, and conduct surveillance and intelligence in an undersea and littoral environment. Specific items within this technical capability include

the sail mounted and deployed (buoy and floating wire) antenna, periscope, snorkel, I&EW, and radar systems. Of critical importance is the operation of the HM&E components, which raise and lower or deploy and retrieve sensors from the submarine. Failure of this equipment results in the inability to send or receive communication and I&EW information, to navigate safely, to covertly gather information, to conduct tracking, surveillance and targeting operations and can compromise crew and submarine during hostile operations. Principal functions performed are the research and development, test and evaluation, engineering, Submarine Safety Certification Program (SUBSAFE) certification, and life cycle management of undersea vehicle sail and deployed systems and equipment.

1.1 Carderock Division Detachments, Remote Offices, Other Supported Activities, and Ranges

The Carderock Division is responsible for the operation of the following activities in support of its mission:

- Ship Systems Engineering Station, Philadelphia, PA
- Special Trials Facility, Patuxent River, MD
- Combatant Craft Department, Norfolk Little Creek, VA
- Acoustic Trials Department (USNS Hayes), Port Canaveral, FL
- South Florida Testing Facility, Fort Lauderdale, FL
- Research Vessels - Athena I & II and Lauren, Panama City, FL
- Memphis Detachment - Large Cavitation Channel, Memphis, TN
- Acoustic Research Detachment, Bayview, ID
- Bremerton Detachment, Bremerton, WA
- Southeast Alaska Acoustic Measurement Facility (SEAFAC), Ketchikan, AK

2.0.Corona Division

The Corona Division, located in Norco, CA (Navy Region West), is the Navy's only independent analyses and assessment center. It has the mission of gauging the warfighting capability of ships and aircraft, from unit to battlegroup level, by assessing the suitability of design, the performance of weapons and equipment, and the adequacy of training. In order to carry out this mission, NSWC Corona Division possesses a number of unique capabilities. Foremost among these are the Joint Warfare Assessment Laboratory (JWAL) and the Measurement Science and Technology Laboratory (MS&T). JWAL is the cornerstone of the Divisions integrated approach to warfare assessment and the focal point of the Divisions internal and external interconnectivity. The MS&T Laboratory provides unique and advance measurement capabilities that arm warfighters with the most accurate, reliable weapons and test equipment in the world. Additional information on the Corona Division is located at http://www.corona.navy.mil/. The Corona Division technical capabilities are:

- **Warfare Performance Assessment** - Analyzes and evaluates the performance of developmental and operational weapons and combat systems using consistent, government-controlled evaluation criteria, procedures, techniques, and analyses methodology to gauge success. Provides an objective determination of warfare capability in threat-representative scenarios and operational environments. Identifies and evaluates the factors that enhance or limit systems capability and effectiveness; assist to isolate root cause and operational criticality, and

supports the technical community to effectively manage corrective actions. Performance databases are developed and maintained to verify and validate Fleet readiness, models and simulations, and the efficacy of system improvements. Assessment of warfighting capability of unit, joint, and combined forces during training exercises to evaluate mission area effectiveness and supports improvements.

- **Quality and Material Readiness Assessment** - Quality and Readiness Assessment provides the Government's technical assessment of material readiness, requirements, products, and processes for Weapons and Combat systems during all life-cycle phases to improve quality, reliability, producibility, performance and Fleet readiness. The assessment is provided by the functions of Shipboard Material Readiness, Surface Missile Systems Material Readiness, Quality Management, and Quality Engineering. The Division provides life cycle support to Program Management Offices (e.g., NAVSEA, Naval Air Systems Command (NAVAIR), Space and Naval Warfare Systems Command (SPAWAR), PEOS and USA, U.S. Air Force (USAF), and Department of Energy (DOE)) during the acquisition deployment, and in-service life of Weapons and Control Systems. The Division also provide research, expertise, and products for guidance and policy from DoD and Office of the Secretary of the Navy (OSN) through the PEO-level and represent the Government on industry standards committees.

- **Measurement and Test Assessment** - Measurement and Test Assessment evaluates interface requirements, test requirements, and processes to assure interchangeability of interfaces, test system effectiveness, and their measurement integrity. This is accomplished through interface analyses, test systems assessment, and metrology engineering. In each of these three engineering areas, government expertise and contractor oversight is required to ensure product and technical integrity.

- **Range Instrumentation Engineering and Management** - This technical capability provides government control, expertise, and oversight for the systems engineering, management, acquisition, and life cycle support for range instrumentation, and telecommunication systems for the Navy's test and Tactical Training Range (TTR) communities. This capability makes possible and supports the collection, assessment, analyses, evaluation, and distribution of data to improve the military proficiency and readiness of surface ship combat systems.

2.1 Corona Division Detachments, Remote Offices, Other Supported Activities and Ranges

- Fallon, NV.
- El Centro, CA.
- Yuma, AZ.
- Quantico, VA.
- Oceana, VA.
- Key West, FL.
- Beaufort, SC.
- Cherry Point, NC.

3.0.Crane Division

The Crane Division, located in Crane, IN (Navy Region South-Central), has the mission of providing cost effective, quality, and responsive acquisition, engineering, logistics, and maintenance for the Fleet's weapon and electronic systems, ordnance, and associated equipment and components. Crane Division is the U.S. Navy's best, fully integrated, acquisition and Fleet support organization providing engineering and industrial base support of weapons systems, subsystems, equipments, and components with principal emphasis on industrial and product engineering associated with surface warfare systems in the areas of electronics, ordnance, pyrotechnics, gun systems, microwave technology, small arms, and surface ship electronic warfare in-service engineering. Additional information on the Crane Division is located at http://www.crane.navy.mil. The Crane Division technical capabilities are:

- **Electronic Warfare (EW) Systems Acquisition, Engineering and Industrial Base Support** -Provides engineering and industrial base support for acquisition, testing and maintenance of EW Systems. Support includes integrated engineering, acquisition, logistics and maintenance, installation, direct Fleet Support, removal, reuse, disposal, and program management support of EW systems across all warfare areas. Includes teaming with the Fleet, industry and other Government Activities to maintain and improve EW systems, subsystems, components and support equipment across all warfare areas throughout their life cycles.

- **Microelectronic Technology** - Microelectronic technology products are an integral part of all modern weapons systems. Crane Division develops technical requirements to support acquisition offices, performs evaluations to assure that these products are appropriately selected and robustly designed into systems, and supports the products and the systems that use them throughout their deployment and life-cycle. Products include microcircuits, circuit cards and processors, packaging and interconnect technologies and other electronic assemblies.

- **Electronic Module Test and Repair** - Provides the full spectrum of life cycle support functions at the electronic module level. This includes development of test requirements and test systems, product and source certification testing, obsolescence support, failure analyses, manufacture, test and repair. Progressive maintenance and distance support capabilities are included. Services include computer resource management, prototype and limited manufacturing, installation, direct Fleet support, reverse engineering, calibration, reutilization, repair and up-grade. Includes teaming with the Fleet, industry and other Government Activities to provide solutions to problems at the module or product level.

- **Microwave Components** - Provides complete life cycle support of microwave components for military weapon systems. Includes design, testing qualification, failure analyses, repair, procurement, and engineering expertise necessary to develop and support military weapons systems. Services provided include test and repair of microwave tubes, Microwave tube ISEA for AEGIS and Navy Surface Search Radars, Fleet and ship problem investigations, executive agent for microwave tubes for DoD, system requirements determination, item management, reliability analyses, manufacturing audits, cathode life testing for DoD and National Aeronautics and Space Administration (NASA), failure analyses and engineering solutions for microwave tube problems, organic qualification testing of microwave components,

microwave laboratory test equipment design and construction, microwave failure analyses and repair.

- **Batteries and Energy Storage Devices** - Includes engineering expertise and facilities to provide industrial base support services for batteries and other energy storage and transfer devices (fuel cells, Uninterruptible Power Supply (UPS), solar cells, power supplies and ancillary equipment). Services include: product improvement, requirements definition, design, development, prototyping and limited production, acquisition and acquisition engineering, standardization, T&E, safety certification, technology evaluation and insertion, production engineering, in-service engineering, maintenance, Fleet training and system retirement.

- **Acoustic Sensors** - Provides acquisition support, test facilities, in-service engineering (including alterations) and integrated logistics concepts for Acoustic Sensors. Integration of these efforts requires extensive system knowledge gained through a highly extensive technical work force involved in the entire life cycle of the products. Capability includes engineering, technical, logistics, surge production and repair.

- **Small Arms** - Provides complete life cycle support for Small Arms weapon systems. Responsibilities include design, development, T&E, acquisition, depot overhaul, and logistics management of small and minor caliber gun systems. This includes integration of state-of-the-art sensor and stabilization technology to enhance the overall performance of the weapon system. This technical capability is coordinated with Crane's responsibilities for Life Cycle Management of Night Vision and Electro-Optics (NVEO) and RADAR equipment. Many of the advanced gun weapon systems and capabilities are already being employed in the direct support of current Anti-Terrorism and Force Protection. This capability also supports United States Special Operations Command (USSOCOM), USMC, USCG, USA, and USAF.

- **Conventional Ammunition Engineering** - The Conventional Ammunition Engineering technical capability provides comprehensive life cycle management functions to provide safe, reliable and effective munitions to the Fleet, USMC and SOF. The capability provides program management, design and development, Commercial Off-the-Shelf (COTS) insertion, simulation and modeling, systems safety support, acquisition and in-service support, T & E including quality evaluation, maintenance, logistics support and demilitarization and disposal functions.

- **Pyrotechnic Technology** - Provides the warfighter with affordable, safe, reliable and effective pyrotechnics for the many varied functions that are supported including infrared countermeasures, target enhancement, illumination and signaling and marking. Provides total life cycle support including program management, research, modeling and simulation, design and development, COTS insertion, test and evaluation, product improvement, acquisition and production support, quality evaluation, Fleet support and demilitarization and disposal for all Navy pyrotechnics. This capability also supports the USA, USAF, and the private sector. Provides Navy expertise and leadership for pyrotechnics.

- **Defense Security Systems** - Provides expertise to achieve total security solutions for safeguarding personnel, property and material aboard Navy ships and at Navy, USMC, and other DoD shore installations and activities. By coupling extensive knowledge of physical security

with a workforce skilled in design, acquisition, logistics and integration, the capability acts as a technical agent providing dynamic, regionalized, integrated force protection solutions employing the latest in COTS electronic and physical security equipment.

- **NVEO Devices and Chemical, Biological, Explosive Detection Systems Acquisition, Engineering and Industrial Base Support** - Provides cradle to grave engineering and industrial base support for Night Vision, Lasers, Thermal Imagers, and Multi-Sensor Electro-Optic systems for NAVSEA, NAVAIR, USMC, USCG, SOF, USSOCOM, and USAF. Provides life cycle management, engineering and industrial base support for Chemical, Biological, and Explosive Detection Equipment. Support includes developing, purchasing, testing, maintaining, fielding, installing and improving such equipment and representing the Navy on many Joint Service logistics and acquisition teams. Provides Program Management for Fleet Night Vision Devices.

- **Radar Systems** - Provides the NAVSEA Acquisition Program Managers technical alternatives for making investment decisions for acquisition of radar material resources, and provides the disciplines in the systems acquisition process to assure that the government obtains a product that satisfies the military requirement. Provides a core technical capability for Navy detection radar systems and components with emphasis on industrial support. Deputy Program Management services are provided for planning and budgeting, monitoring and controlling and directing. Acquisition Engineering services provided are technology management, affordability analyses, and developing technical data packages. Product Engineering services include affordability analyses, design and development consulting, modeling and simulation, test and evaluation, limited manufacturing and reverse engineering. Maintenance and Repair services include production planning and control, initial inspection and testing, repair and overhaul.

3.1.Crane Division Detachments, Remote Offices, Other Supported Activities and Ranges

- NSWC Crane Division, Fallbrook Detachment, Fallbrook, CA.
- Gendora Lake Test Facility, Sullivan, IN.
- Fleet Sensors Support Facility, Al Manama, Bahrain.

4.0.Dahlgren Division

The Dahlgren Division is the U. S. Navy's principal research, development, and test and evaluation, engineering and Fleet support activities for surface warfare, surface ship combat systems, ordnance, strategic systems, amphibious warfare, mines and mine countermeasures, diving, life support, and damage control systems and special warfare systems. The Division is comprised of three major sites: Naval Surface Warfare Center, Dahlgren Laboratory in Dahlgren, VA (Navy Region National Capital); NAVSEA NSWC Panama City in Panama City, FL (Navy Region South-Central); and the Combat Systems Direction Activity at Dam Neck in Virginia Beach, VA (Navy Region East). Additional information on the Dahlgren Division can be located at http://www.nswc.navy.mil/wwwDL/; http://www.ncsc.navy.mil/; and http://www.navseadn.navy.mil/. Dahlgren Division technical capabilities are:

- **Warfare Analyses and Modeling** - This capability identifies strengths and weaknesses of warfare systems in meeting national objectives; conducts special studies to evaluate the effects of modifying force structure, targets, or tactics, and provides science and technology guidance. It

provides assistance in developing requirements and options for future forces; developing and improving weapon systems; evaluating variations in threat scenarios and impacts of technologies; and assessing comparative capability versus costs for Forces, Warfare Mission Areas, and Systems.

- **Mission Planning and Targeting Systems** - This technical capability is specifically concerned with the development of mission planning and targeting systems for the tactical and strategic systems noted as well as with the development and application of technology to meet future needs. This applies to existing systems, evolving systems and to needs not previously identified by the Navy or other services.

- **Sensor Systems RDT&E** - Provide for the RDT&E of passive and active radio frequency (RF) and electro-optic (EO) sensors for naval warfare systems. This function is full spectrum, including RDT&E of exploratory, advanced and engineering development sensors and systems as well as lifetime systems engineering support and software support agent functions for fielded sensors and sensor systems. This capability also provides worldwide quick reaction support to the Fleet to develop new sensors, modify existing sensors and to develop and evaluate sensor countermeasures in times of crisis.

- **Combat and Weapon Control Systems** - Specifies and leads the development and support of combat and weapon control systems for the Navy's surface ship Fleet. Includes analyses, technology development, integration and evaluation, and testing of combat and weapon control systems. Also includes all the capabilities, functions, components, and elements required to develop, systems engineer, test, and support the combat and weapon control systems from conception through their lifetime as well as adapting and transitioning new technologies and advanced capabilities to meet changing requirements.

- **Engagement Systems RDT&E** - Provides RDT&E and acquisition support for virtually every engagement system (including surface launched missiles and missile launchers, guns, gun ammunition, and ship launched decoys) aboard Navy surface ships – from technology development to shipboard integration. The most important role is to provide the systems engineering and integration required to transform a multiplicity of system elements into an effective warfare system. This process involves the flowdown of requirements necessary to define the specifications for new weapon systems, product improvements, and shipboard modifications.

- **USMC Weaponry Systems RDT&E** - Provides the technology base and conducts RDT&E to develop and demonstrate technologies to meet the USMC unique weapons responsibility for expeditionary missions, amphibious warfare, and subsequent operations ashore. This responsibility includes the design and development of new systems or components, product improvements enhancing the military performance of existing systems or components, the neutralizing of deficiencies in stated requirements, and weapons system acquisition.

- **Strategic Systems** - The mission in strategic systems is technology advancement, systems engineering, software development, and operational support for Navy strategic systems. The current Navy strategic weapons system focus is on the SLBM system, especially in the areas

of weapons control, targeting, and reentry systems. It addresses all United States and United Kingdom (U.K.) SLBM systems. Development of SLBM modernization concepts and new system concepts (e.g., SSGN) is also supported.

- **EW Systems RDT&E** - Conduct of full spectrum RDT&E in EW systems for surface ships and for special purpose intelligence collection equipment for submarines, aircraft, and surface ships. This includes the development of new technologies, such as the application of high power microwave, for application in surface ship sensor and countermeasures systems; provides for the transition of new technologies to existing and planned EW suites; provides acquisition support, technical evaluation and T&E of systems developed by industry; and develops technologies and fields systems for special purpose intelligence collection purposes.

- **Amphibious Warfare Systems** - This technical capability includes the facilities and expertise to develop and support amphibious warfare systems required by joint Navy and Marine Forces to conduct expeditionary operations. These systems are deployed on a wide variety of amphibious platforms such as the LHD, LSD, LHA, LPD ship classes; strategic sealift ships; and landing craft are utilized. Amphibious warfare systems include: Landing Craft Air Cushion (LCAC) ship and craft interface systems; command, control, communications and navigation equipment; decision support systems; targeting sensors; battlespace information management systems; assault breaching systems; and ship-to ship and ship-to-shore transport systems for amphibious warfare. Technology expertise is also provided in the areas of systems integration and interoperability; command and control; air cushion vehicles; and battlespace information management.

- **Special Warfare Systems** - This technical capability includes the facilities and expertise to develop and support the systems and equipment required by SOF to conduct their missions. Special Operations generally are accepted as being non-conventional in nature and clandestine in character. Missions include special mobility operations, unconventional warfare, coastal and riverine interdiction, beach and coastal reconnaissance and certain intelligence operations. These missions require vehicles that may be manned such as the Swimmer Delivery Vehicle (SDV), remotely operated or autonomous.

- **Weapons Systems Safety** - Provides analytical, technology base, systems engineering, product development, and Fleet support expertise to assess compliance of systems safety and survivability requirements of Fleet assets, especially surface warfare assets. Defines and determines effects from shock, blast, fragments, toxic products, and laser radiation in the life cycle evolution of weapons or combat systems. Assesses system and item vulnerabilities, including software; and specifies, designs, and develops means to remove failure modes, control environments, limit damage, or otherwise reduce possible loss of combat capability.

- **Electromagnetic Environmental Effects (E^3)**- Lead for E^3 RDT&E that assures operational effectiveness of Naval and joint systems exposed to stressing electromagnetic (EM) environments. Develops and applies analytical and experimental techniques, facilities, and instrumentation required in the EM susceptibility and vulnerability assessment of electronic components, circuits, and systems. Coordinates and directs programs such as Hazards of Electromagnetic Radiation to Ordnance (HERO), Hazards of Electromagnetic Radiation to

Personnel (HERP), and Hazards of Electromagnetic Radiation to Fuel (HERF) and Electromagnetic Vulnerability (EMV) to determine EM effects on equipment and systems. Investigates specific and generic EM susceptibility problems and develops, evaluates, and recommends procedural and hardware changes to ensure successful mission completion. Manages the Shipboard Electromagnetic Capability Improvement Program and serves as the E^3 Battle Force interoperability electromagnetic interference (EMI) problem solver for the Navy. Develops and validates analytical and experimental techniques and tools, including computational electromagnetics, to predict and assess topside design issues based on location and performance. Coordinates and directs programs to achieve integrated topside designs maximizing system performance in the EM environment for new ships and ship alterations. Provides, via the Electromagnetic Compatibility Analysis Program (EMCAP), processes and guidance for Battle Force frequency management to the Fleet, anywhere and anytime.

- **Chemical Biological Warfare (CBW) Defense Systems RDT&E** - This capability covers all aspects of CBW Defense. It provides the technology base, threat analyses and the full spectrum of engineering expertise necessary to design and develop the equipment needed to protect Naval and Joint Services forces afloat or ashore, whether the threat is chemical or biological.

- **National Needs** - National attention is focused on military participation in nontraditional missions. The National Needs technical capability provides robust integration across the spectra of research, development, analyses, deployable tools and systems to assist the services, other government agencies, and the civilian sector in supporting evolving non-traditional missions. It addresses homeland security initiatives by providing the technical and systems engineering capability necessary to mitigate the effects of asymmetric threats on our homeland to include homeland defense and support to civilian authorities. It supports force protection requirements in the areas of combating terrorism, physical security, operations security and personal protective services by developing products to mitigate hostile actions against DoD personnel, resources, facilities, and critical information. It includes a commercial and defense critical infrastructure protection and mission assurance capability by providing the ability to identify critical infrastructure susceptibilities and operational dependencies that, if not assured, could adversely impact mission success or continuity of operations. And from an asymmetric warfare perspective, it provides operational response options that fill the gap along the force escalation curve for the purpose of implementing National policy such as enforcement of trade sanctions and exclusion zones, maritime intercept operations, and humanitarian assistance. For example, Dahlgren serves the DoD at the PEO level in the areas of Counter-Drug Technology, Infrastructure Assurance, and Special Technology Countermeasures, in addition to executing PEO-level responsibilities for the Navy in the area of Operations Other Than War (OOTW).

- **Battleforce Systems RDT&E and Interoperability** - This technical capability encompasses the analyses, systems engineering, and assessment of systems at the force warfare or mission level. Included are integrated systems that provide capability at the force, battle group, and theater level such as Ballistic Missile Defense. Major themes running through out include requirements definition, performance and cost trade studies, force structure assessment, and battlegroup and force interoperability.

- **Mine Countermeasure Systems** - This technical capability includes the development and implementation of new technologies to conduct defensive mine warfare. Defensive mine warfare includes detecting, identifying, and neutralizing mine threats from deep water through the surf zone. Detection and identification may use magnetic, acoustic, and electro-optics as well as other technologies. Neutralization uses systems ranging from minesweeping to explosive clearance. Assets used for defensive mine warfare operations include both dedicated and organic air, surface and sub-surface platforms as well as remotely controlled and unmanned systems. Included in this technical capability are the specialized facilities and expertise needed to exploit the new technologies found in existing and emergent mine threats and to develop new systems and tactics to counter those threats.

- **Mine Systems** - This technical capability includes the development and implementation of new technologies and systems to conduct offensive mine warfare. Offensive mine warfare includes those people and facilities necessary for successful and innovative research, design, development, analyses, modeling, engineering, test, acquisition, platform integration, as well as Fleet and operational support for safe, effective, high technology mine systems and sub-systems including deployment equipment.

- **Diving Systems** - This technical capability encompasses RDT&E, acquisition support and man-rated In-Service Engineering support for the Navy's underwater diving life support systems and specialized equipment as well as support for tri-service diving requirements. This technical capability is needed for underwater Naval Special Warfare (NSW), Explosive Ordnance Disposal (EOD), USMC Swimmer, and Salvage Diving for in-theater ship repair, particularly in areas remote from dry dock and pier facilities. The ability of divers to conduct reconnaissance, recover ordnance, and repair damage can be a critical factor in maintaining the operational status of the deployed task force.

- **Life Support Systems** - This technical capability encompasses full spectrum support for the Navy's underwater and surface personal life support systems. In addition, this technical capability adapts and develops systems and technologies applicable to providing life support in a wide variety of other extreme environments in which manned systems are required to operate. This technical capability includes RDT&E, acquisition support and man-rated In-Service Engineering for critical Life Support systems and specialized equipment necessary for manned operations in hazardous environments such as Damage Control and Firefighting as well as providing protection and an operational capability in chemical and biological hazard scenarios.

- **Product-Oriented Research, Exploratory and Advanced Development** - this technical capability encompasses full spectrum support for:

  (a) Structuring a comprehensive Division Science and Technology (S&T) Program.
  (b) Planning and executing independent research and independent exploratory development (IR/IED) programs. Technically planning and executing product-oriented technology programs assigned by ONR.
  (c) Defining and conducting shallow water and very shallow water exploratory and advanced development systems programs.

(d) Maintaining awareness of university and commercial technology by establishing partnering mechanisms and agreements.
(e) Maintaining awareness of foreign technology and act as the national leader for assigned areas.
(f) Defining and managing involvement in technology reinvestment project (TRP) and defense technology conversion initiatives.
(g) Developing state-of-the-art tools, measurement systems and mathematical methods necessary in the research and exploratory development process.
(h) Rapidly prototype enabling technologies and transition them to industry through such processes as advanced technology demonstrations (ATDs).

4.1 Dahlgren Division Detachments, Remote Offices, Other Supported Activities and Ranges

- Re-entry System Dahlgren Division Detachment, Washington, DC.
- Special Operations Command Technical Support Center, Tampa FL.
- Potomac River Test Range, Dahlgren, VA.
- Explosive Experimental Area, Pumpkin Neck, VA.
- Joint Gulf Test Range.
- Coastal Test Range, Panama City, FL
- Near-Shore Influence Test Range, Panama City, FL
- Naval Experimental Diving Unit (NEDU).
- Naval Diving and Salvage Training Center (NDSTC).

5.0.Indian Head Division

The Indian Head Division, located in Indian Head, MD (Navy Region National Capital) is the U. S. Navy's principal research, development, and test and evaluation, engineering and Fleet support activity providing the full spectrum of technical capabilities necessary to rapidly move any "energetics" product from concept through production, to operational deployment. Additional information on the Indian Head Division can be located at http://www.ih.navy.mil). Indian Head Division technical capabilities are:

- **Missile Propulsion, Rockets, JATOs, PADs, Gun Ammunition, Underwater Warheads and Associated Sub-Systems** - This technical capability supports the full life-cycle for Rockets, JATOs, Propellant Actuated Devices (PADs), Missile Propulsion (Boosters and Rockets), Gun Ammunition, and Underwater Warheads. The capability includes research, development, energetic selection and characterization of propulsion and explosive systems; propellant (i.e. solid, gelled, liquid, etc.) explosive, and pyrotechnic processing techniques for ordnance; use of thermal, structural, ballistic, and flight modeling analyses to design rocket motor cases, nozzles, and igniters; and line, mix, assembly, test and evaluation of energetic formulations and prototype propulsion and explosive systems. This technical capability also includes full life cycle support for underwater warheads, fuzing and initiation systems, and MicroElectro Mechanical Systems (MEMS) research and development; this includes target vulnerability (including foreign systems) assessment; warhead exploratory research and development; and naval weaponry test and evaluation. Indian Head Division in-service engineering support includes engineering, integrated logistics support, maintenance, surveillance,

and technical documentation support for energetic systems as well as the safety, maintenance and training for the end user.

- **Energetic Material Research, Development and Manufacturing Technology** - The Indian Head Division provides research, synthesis, development, and manufacture of specialty energetic chemicals, explosives, components for explosive systems, solid propellants, gelled propellants, liquid propellants, ignition materials, and pyrotechnics. In 1995, the Office of Naval Research (ONR) established the Energetics Manufacturing Technology Center of Excellence at the Indian Head Division. The Center interacts with the Navy Acquisition Program Offices, the PEO's, and the System Commands to identify and validate pervasive producibility and affordability issues and coordinates through the Joint Defense Manufacturing Technology Panel, with other service Manufacturing Technology (MANTECH) programs to eliminate duplication and leverage investments. The MANTECH Program focuses on the development and technology transfer of new manufacturing technologies and processes for energetic materials; including manufacturing and producibility issues unique to energetics. This capability also includes the application of state of the art equipment and processing techniques to the development and manufacture of new or existing energetic materials. The Divisions energetics manufacturing capability allows for the transition of energetic materials from laboratory bench scale to low rate initial production (LRIP) quantities. This capability also provides support for production rate surges and provider of last resort (for military unique products, products not available in industry) as required by military emergencies.

- **Cartridge Actuated Devices (CADs), Cutters, Sounding and Specialty Devices** - In 1998 the CAD/PAD Joint Program Office was established at the Indian Head Division to improve the services' interoperability, reduce duplication and costs, optimize resources, and increase standardization. The Indian Head Division holds the tri-service charter for RDT&E, engineering, acquisition, manufacturing, and Fleet support of cartridge actuated devices (CADs) and propellant actuated devices (PADs). PADs are similar to rocket motors. CADs perform vital functions such as stores ejection, flare and chaff deployment, and sequencing functions in aircrew escape and various weapon systems. The resources required to provide full spectrum support for these devices are consolidated at the Division. Design, engineering, and prototype capabilities enable the development of emerging technologies to transition into operational evaluation and service use. Integrated manufacturing facilities provide pilot scale and low rate production with the ability to meet rapid response and mobilization requirements. Complementing these capabilities are specialized nondestructive and destructive test facilities dedicated to CAD/PAD testing. Acquisition engineering and management functions allow the Indian Head Division to perform the "smart buyer" role for DoD and FMS customers. This full spectrum support is rounded out by a comprehensive Fleet support capability providing integrated logistics support, maintenance engineering, and training of Fleet personnel. This capability spans the entire life cycle of CAD (and similar devices) activity from: R&D to Fleet support of aircraft, missile and target subsystems (e.g. aircrew escape, stores or bomb racks, ECM, fire extinguishers, and missile flight components).

- **Weapon Simulators, Trainers, Training, Test and Diagnostic Equipment** - Weapons simulation and emulation is a mission critical function for the Navy because the products are required for certification of weapons systems to fire live ordnance and they provide a safe and

cost effective way of keeping personnel trained and ready. The Indian Head Division's weapon and missile simulators, trainer, training, and test and diagnostic equipment technical capability has successfully evolved over a 35 year period. This capability was consolidated at Indian Head Division primarily because weapon and missile simulators and certification test equipment designed and manufactured by system prime contractors were proprietary products that were missile or weapons system specific, expensive to procure, difficult to maintain and incorporated no common simulation approach or no common hardware architecture. Because simulators and certification test equipment are procured in limited quantities, which are not profitable for industry to design and fabricate, the Division is frequently called upon as the source of last resort.

- **Energetic Safety, Environmental Technology, Logistics, and PHS&T** - The growing concern for explosive safety and the environment compliance places constraints on the research, development, manufacture, and use of hazardous materials in energetics. The nature of the energetics work performed at the Indian Head Division provides a natural link to the explosives safety; logistics; packaging, handling, storage and transportation (PHS&T); and environmental issues surrounding energetic materials and ordnance. The Naval Ordnance Safety and Security Activity (NOSSA) including the Ordnance Environmental Support Office (OESO) utilizes Indian Head Divisions expertise for environmental, explosives safety and ordnance safety issues. In recent years this capability has expanded to include Environmental and PHS&T Research and Development activities. As a result, the Indian Head Division has stayed ahead of the technology curve required to ensure safe and environmentally compliant energetic materials processing and support, in line with current standards.

5.2.Indian Head Detachments, Remote Offices, Activities and Ranges

- Naval Packaging Handling, Storage and Transportation Center, Earle, NJ.
- Strategic Systems, Seal Beach Detachment, Seal Beach, CA.

6.0.Port Hueneme Division

The Port Hueneme Division, located in Port Hueneme, CA (Navy Region West) has the mission of providing T&E, In-Service Engineering (ISE), and ILS for Surface Warfare Combat Systems and Subsystems, Unique Equipments, and Related Expendable Ordnance of the Navy Surface Fleet. The Port Hueneme Division is the U.S. Navy's best, fully integrated, acquisition and Fleet support organization providing for combat and weapon systems installed in the U.S. Navy surface Fleet, USCG Fleet, and many foreign Navy fleets. These weapon systems include the AEGIS Combat Systems, Ship Defense Systems, Ship Missile Systems, Vertical and Guided Missile Launching Systems, Gun Weapon Systems and UNREP. Whether testing equipment that includes Cold War-era weapons and high-tech Tomahawk cruise missiles fired in the Persian Gulf, or working to enhance future capabilities for the Navy, the Divisions mission is to ensure that warfare systems operate safely for the Fleet Sailors and are effective in hitting their mark. Additional information on the Port Hueneme Division can be located at http://www.phdnswc.navy.mil/). Port Hueneme Division technical capabilities are:

- **Theater Warfare and Battleforce Systems ISE, T&E, and ILS** - Provide ISE, T&E and ILS at the Theater Warfare and Battleforce Level. Provide systems engineering and analyses

in support of integration of sensors, control systems and weapons used to provide battleforce, theater and area defense from surface ships, including joint interoperability. Ensure integration, interoperability, and effectiveness of battleforce warfare systems through the assignment of Battleforce Action Teams. Provide logistics support for shipboard system elements as well as test and evaluation of advanced systems and upgrades to current systems. Develop Joint Capabilities and Limitations documents and provide inputs to tactics development.

- **Surface Combat Systems ISE, T&E, and ILS** - Provide ISE, T&E and ILS of Combat Systems during all phases of the system life cycle. Develop system requirements & specifications. Provide Systems Engineering and analyses to support the full integration of combat system elements. Analyze Fleet combat system integration problems and failures to provide engineering and logistic solutions. Plan, manage, and conduct test and evaluation throughout life cycle. Develop Capabilities and Limitations documents and provide inputs to tactics development. Develop and conduct combat system level tests. Conduct Combat System Ships Qualification Trials (CSSQTs) during which the entire combat system, support elements, and personnel are assessed.

- **Surface Weapon Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire life cycle of weapon systems. Provide input to the design and development of new weapons systems; assume design agent for out of production systems. Plan manage and conduct test and evaluation throughout life cycle. Analyze Fleet problems and failures to provide engineering and logistic solutions. Provide a full array of logistics services to the Fleet. Inspect, Test and Certify weapons systems. Train and certify personnel. Develop, maintain, test, certify, and distribute tactical and support software. Ensure safety, effectiveness and affordability of operational weapons systems. Develop maintain, test, certify ,and distribute tactical software.

- **UNREP Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire life cycle of UNREP systems. Develop system specifications and requirements for future systems. Includes design and development of advanced UNREP systems. Provide installation and modernization of UNREP machinery and equipment. Provide shipboard technical support, analyze Fleet problems and failures, and produce engineering and logistics solutions.

- **Surface Gun Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire life cycle of major and minor caliber gun systems and decoy launching systems. Provides support for design and development of advanced gun systems. Ensure safety and operational readiness is maintained and that the systems are managed efficiently and effectively. Develop system documentation and procedures, maintain computer programs, and certify gun systems. Analyze Fleet problems and failures to produce engineering and logistics solutions.

- **Surface Missile Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire missile life cycle. Ensure missile safety and operational readiness are sustained at the required levels, and that missile systems are managed efficiently and effectively. This technical capability spans elements of requirements and performance effectiveness, ground testing and test systems, flight test, safe missile handling, transportation and storage ashore, and onboard transit ships and combatants.

- **Surface Launcher Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire launching system life cycle. Ensure safety and operational readiness is maintained and that the systems are managed efficiently and effectively. Develop requirements, system specifications and procedures, computer programs and procedures. Certify launching systems and personnel to enable systems and crews to operate safely and effectively. Analyze Fleet problems and failures to produce engineering and logistics solutions.

- **Surface Ship Sensor Systems ISE, T&E, and ILS** - Provide ISE, T&E, and ILS throughout the entire sensor system life cycle. Ensure safety and operational readiness is maintained and that the systems are efficient and effective. Develop system documentation and procedures, remote monitoring, maintenance plans, computer programs and procedures. Analyze Fleet performance and identify issues to produce engineering and logistics solutions.

6.2 Port Hueneme Division Detachments, Remote Offices, Other Supported Activities and Ranges

- NAVSEA Port Hueneme San Diego Detachment, San Diego, CA.
- NAVSEA Port Hueneme White Sands Detachment, White Sands, NM.
- NAVSEA Port Hueneme Louisville Detachment, Louisville, KY.
- NAVSEA Port Hueneme Virginia Beach Detachment, Virginia Beach, VA.

B. NAVAL UNDERSEA WARFARE CENTER (NUWC)

The Naval Undersea Warfare Center (NUWC) is the Navy's full-spectrum research, development, test and evaluation, engineering and Fleet support center for submarines, autonomous underwater systems, and offensive and defensive weapons systems associated with undersea warfare. NUWC is headquartered in Rhode Island, and has two major subordinate activities -- Division Newport and Division Keyport. NUWC leadership areas consist of:

- Undersea Warfare Modeling and Analyses.
- Submarine Combat and Combat Control Systems.
- Surface Ship and Submarine SONAR Systems.
- Submarine Electronic Warfare.
- Submarine Unique On-Board Communication Systems and Communication Nodes.
- Undersea Ranges.
- Submarine Electromagnetic, Electro-Optic and Nonacoustic-Effects Reconnaissance, Search and Tracking Systems.
- Undersea Vehicle Active & Passive Signatures (Except HM&E).
- Submarine Vulnerability and Survivability (Except HM&E).
- Torpedoes and Torpedo Countermeasures.

1.0.Newport Division

The Newport Division, located in Newport, RI (Navy Region East) is the U. S. Navy's principal research, development, and test and evaluation, engineering and Fleet support activity providing the technical foundation that enables the conceptualization, research, development, fielding, modernization, and maintenance of systems that ensure the U.S. Navy's Undersea Superiority (Additional information on the Newport Division can be found at http://www.npt.nuwc.navy.mil/). The Newport Division has the responsibility for the full life cycle of submarine and undersea warfare systems encompassing:

- Research and Development.
- Prototyping.
- Systems Development.
- Acquisition and Production Support.
- Testing and Evaluation.
- Fleet Support.
- Partnering with Industry and Academia.
- USW Analyses.

The Newport Division has leadership in the following submarine and surface ship systems:

- Submarine leadership areas include - ElectroOptic Systems; Electromagnetic Systems; SONAR Systems; SONAR Countermeasures; Torpedoes; Torpedo Countermeasures; Weapon and Countermeasure Launcher Systems; Tactical Missiles Integration; Non-Acoustic Effects Systems; Undersea Warfare Modeling and Analyses; Survivability Systems (e.g., Mine Avoidance SONARs); Tactical Undersea Ranges; Undersea Vehicles (Unmanned Undersea Vehicles and Targets); Combat Systems; Combat

Control Systems; Onboard Communication Systems and Nodes; and Electronic Warfare Systems.

- Surface Ship leadership areas include - Tactical Warfare Systems for Surface Ship Undersea Warfare; Torpedo Countermeasures; Torpedo Launcher Systems; Countermeasure Launcher Systems; Torpedoes; Undersea Vehicles (Unmanned Undersea Vehicles and Targets); Tactical Undersea Ranges; Undersea Warfare Combat Systems; Undersea Warfare Modeling and Analyses; Mine Avoidance SONAR Systems; Hull-Mounted and Towed SONAR Arrays (Sources and Receivers); SONAR Systems.

The Newport Division has the following major focus areas:

(a) Torpedoes, Targets, Countermeasures, Undersea Vehicles

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Conducting product-oriented research, exploratory and advanced development.
- Performing environmental acoustics characterization and modeling, and research, development and engineering for new systems and hardware and software upgrades for shallow water and arctic operating areas.
- Performing USW modeling and analyses.
- Conducting technical exploitation of foreign systems.
- Developing and engineering new systems and hardware and software upgrades.
- Performing test and evaluation during research, development, acquisition, and follow-on testing.
- Developing essential land-based facilities to support system research, development, acquisition and follow-on testing.
- Conducting all high energy system and component RDT&E and follow-on testing.
- Acting as the Technical Direction Agent (TDA) or Design Agent (DA).
- Assuming technical responsibility for prime contractors.
- Developing system technical specifications.
- Providing TDA or DA support to the PEO or Program Management Office (PMO) Source Selection Evaluation Board (SSEB) process by conducting technical evaluations of contractor proposals for developmental systems.
- Supporting warfare system integration.
- Conducting design reviews.
- Formulating and conducting development testing including critical item test and system hardware and software IV&V.
- Conducting technical progress reviews and identify and define recommended corrections to engineering problems during development.
- Conducting system design certification and integration.
- Developing the Test and Evaluation Master Plan (TEMP).
- Planning and executing Technical Evaluations (TECHEVALs), recommending readiness for Operational Evaluations (OPEVALs).

- Defining, developing and managing system hardware and software baselines.
- Developing production test requirements.
- Providing production support for systems or modifications in production.
- Performing as the Software Support Activity (SSA) for torpedoes and associated automated test equipment.
- Managing Fleet and contractor failure review and corrective action process.
- Conducting Logistics Support Analysis (LSA).
- Providing ILS planning and management.
- Evaluating vendor performance against specifications.
- Designing, developing and providing Fleet support for automatic test equipment
- Making technical recommendations for all milestone decisions.
- Providing technical support for FMS consistent with above roles.

(b) Ranges

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Developing and improving Naval undersea range system, including Major Range and Test Facilities Base (MRTFB) range facilities.
- Providing Range support for RDT&E on Atlantic ranges.
- Acting as the National project officer for underwater range technology data exchange agreement.
- Managing and operating the Atlantic Undersea Test and Evaluation Center (AUTEC) (an MRTFB Facility).

(c) Submarine SONAR and Combat Systems, Surface Ship SONAR ASW Systems, and Arctic Program Coordination

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Conducting product-oriented research, exploratory and advanced development.
- Performing environmental acoustics characterization and modeling, and research, development and engineering for new systems and hardware and software upgrades for shallow water and Arctic operating areas.
- Conducting USW modeling and analyses.
- Conducting technical exploitation of foreign systems.
- Developing and engineering for new systems and upgrades.
- Performing T&E during research, development, acquisition, and follow on-testing.
- Developing essential land-based facilities to support system research, development, acquisition and follow-on testing.
- Acting as the TDA or DA (smart buyer).
- Taking technical responsibility with prime contractors.
- Developing system technical specifications.

- Providing TDA or DA support to the PEO or PMO SSEB process by conducting technical evaluations of contractor proposals for development systems.
- Supporting warfare system integration.
- Conducting design reviews.
- Formulating and conducting development testing including critical item test and system IV&V.
- Conducting technical progress reviews and identify or define recommended corrections to engineering problems during development.
- Conducting system design certification and integration.
- Developing the TEMP.
- Planning and executing TECHEVAL, recommending readiness for OPEVAL.
- Developing and maintaining computer programs and hardware.
- Developing production test requirements.
- Conducting Fleet liaison and Fleet support.
- Developing trainers and training material for assigned systems.
- Conducting LSA and maintenance planning.
- Performing CM.
- Providing test equipment support.
- Performing System installation, checkout and Fleet introduction.
- Making technical recommendations for all milestone decisions.
- Providing technical support for FMS consistent with above roles.
- Managing the Center's Combat System Tests and Certification programs, manage the T&E ranges under the cognizance of NAVSEA, advise NAVSEA on the development of individual ship T&E programs, and identifying and prioritizing the major support resource needs such as range improvements and target requirements for ships and shipboard systems T&E.

(d) Operational Testing

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Conducting ship ASW systems testing (e.g. Fleet Operational Readiness Accuracy Check Site (FORACS), CSSQT, Shipboard Electronic Systems Evaluation (SESE), Weapons Safety Assistance Team (WSAT) for Atlantic ranges.
- Performing all WSAT TDA functions for submarines and surface ships.
- Conducting early operational assessments (EOAs) for COMOPTEVFOR as trusted agent for assigned submarine and USW systems.
- Planning and executing Follow-on Operational Test and Evaluation (FOT&E) for assigned systems.

(e) Tactical Unmanned Undersea Vehicles (UUVs), Submarine Communications, Electronic Warfare (EW), Electro-Optical Systems (Periscopes), Nonacoustic Effects, Submarine-Launched Tactical Missile Systems, Weapon and Countermeasure Launcher Systems

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Conducting product-oriented research, exploratory and advanced development.
- Performing environmental acoustics characterization and modeling, and research, development and engineering for new systems and hardware and software upgrades for shallow water and arctic operating areas.
- Performing USW modeling and analyses.
- Conducting technical exploitation of foreign systems.
- Developing and engineering new systems and hardware and software upgrades.
- Performing test and evaluation during research, development, acquisition, and follow-on testing.
- Developing essential land-based facilities to support system research, development, acquisition and follow-on testing.
- Conducting all high energy system and component RDT&E and follow-on testing.
- Acting as the TDA or DA.
- Assuming technical responsibility for prime contractors.
- Developing system technical specifications.
- Providing TDA or DA support to the PEO or PMO SSEB process by conducting technical evaluations of contractor proposals for developmental systems.
- Supporting warfare system integration.
- Conducting design reviews.
- Formulating and conducting development testing including critical item test and system hardware and software IV&V.
- Conducting technical progress reviews and identify and define recommended corrections to engineering problems during development.
- Conducting system design certification and integration.
- Developing the TEMP.
- Planning and executing TECHEVAL, recommending readiness for OPEVAL.
- Defining, developing and managing system hardware and software baselines.
- Developing production test requirements.
- Providing production support for systems or modifications in production.
- Performing as the SSA for torpedoes and associated automated test equipment.
- Managing Fleet and contractor failure review and corrective action process.
- Conducting LSA.
- Providing ILS planning and management.
- Evaluating vendor performance against specifications.
- Designing, developing and providing Fleet support for automatic test equipment.
- Making technical recommendations for all milestone decisions.

- Providing technical support for FMS consistent with above roles.

(f) Product-Oriented Research, Exploratory and Advanced Development

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Structuring a comprehensive Center Science and Technology (S&T) Program.
- Planning and executing independent research and independent exploratory development (IR/IED) programs.
- Technically planning and executing product-oriented technology programs assigned by ONR.
- Defining and conducting shallow water and Arctic research, exploratory and advanced development environmental and system programs.
- Supporting coordination of PEO and systems commands technology needs and S&T guidance with joint mission area (JMA) assessment process.
- Maintaining awareness of university and commercial technology by establishing partnering mechanisms and agreements.
- Maintaining awareness of foreign technology and act as the national leader for assigned areas.
- Defining and managing involvement in technology reinvestment project (TRP) and defense technology conversion initiatives.
- Developing state-of-the-art tools, measurement systems and mathematical methods necessary in the research and exploratory development process.
- Rapidly prototype enabling technologies and transition them to industry through such processes as advanced technology demonstrations (ATDs).

(f) Undersea Warfare (USW) Modeling and Analyses

A representative sample of the Newport Division responsibilities and capabilities in this area are:

- Supporting JMA assessments.
- Assessing the impact of current and projected technologically feasible threat intelligence data to identify trends and shortfalls.
- Assessing advanced concepts or enabling technologies and support program formulation with infrastructure, cost, risk and performance assessments.
- Quantifying and recommending required ship and USW system characteristics.
- Conducting the AOA and supporting engineering tradeoff studies.
- Quantifying and recommending operational goals and thresholds for program baseline and TEMP documentation and augment developmental test and evaluation (DT&E) and operational test and evaluation (OT&E) testing through simulation.
- Assessing near-term alternatives addressing urgent Fleet needs.
- Conducting technical and vulnerability assessment for assigned USW programs.

- Supporting generation of Fleet guidelines, tactics, and tactical decision aids.
- Managing field team program office.
- Managing the intelligence program office and special intelligence and special compartmented intelligence (SI/SCI) billets and spaces.
- Developing and maintaining credible family of validated submarine and USW simulations and supporting data bases.
- Providing synthetic environments in a distributed network of hardware-in-the-loop and man-in-the-loop facilities which support the product's life cycle and allow interaction with simulated or live forces.

1.1 Newport Division Detachments, Remote Offices, Other Supported Activities and Ranges

- Shipboard Electronic Systems Evaluation Facility (SESEF), Norfolk, VA.
- Shipboard Electronic Systems Evaluation Facility (SESEF), Mayport, FL.
- Seneca Lake SONAR Test Facility, Dresden, NY.
- Dodge Pond Acoustic Measurement Facility, CT.
- NUWC Detachment AUTEC, The Atlantic Undersea Test and Evaluation Center, Andros Island, Bahamas.

2.0 Keyport Division

The Keyport Division, located in Keyport, WA (Navy Region West) is the U. S. Navy's principal engineering and Fleet support activity providing T&E; ISE, maintenance and repair; Fleet readiness, and industrial-base support for USW systems, countermeasures, and SONAR systems. (Additional information on the Keyport Division can be found at http://www-keyport.kpt.nuwc.navy.mil/). Integral to this mission is making Fleet USW systems, countermeasures, and SONAR system dependable by ensuring they are: Proven through Test, Training and Evaluation; Available through Life-Cycle Systems Supportability; and Sustained through Fleet Material Readiness.

The Keyport Division has principal responsibilities in the areas of:

- Integrated USW Systems Dependability.
- Integrated Mine and USW Supportability.
- Undersea Vehicle Maintenance and Engineering.

The Keyport Division has leadership in:

- Test, Training, and Evaluation - Principal provider of full spectrum USW Test, Training, and Evaluation services including test, training, and evaluation planning; test and training conduct; providing real-time, wide-area ranges and ranging alternatives; analyses, and evaluation of systems in both surrogate and real war-fighting environments.
- Life-Cycle Systems Supportability - Principal provider for life-cycle support of Fleet deployed systems. Systems supportability includes engineering and logistics for products, services, and processes introduced in the Fleet. The Keyport Division focuses on

increased system capability, reliability, effectiveness, efficiency, availability and ease of maintenance; with the goal of reducing Navy costs of ownership and operation.

- Fleet Material Readiness - Principal provider of Fleet material support, modernization, and industrial technology, including the preventive and corrective maintenance of undersea vehicles. Modernization and upgrade of components in these products focuses on improving performance, reducing required maintenance, and reducing testing required for new product acceptance. The Keyport Division exploits leading-edge industrial technology and custom engineering to support the R&D community in prototype development and testing.

The Keyport Division has the following major focus areas:

(a) Torpedoes, Targets, Countermeasures, and Undersea Vehicles

A representative sample of the Keyport Division responsibilities and capabilities in this area are:

- Conducting T&E for production acceptance.
- Proofing, Periodics, and Qualification.
- Supporting maintenance engineering for mature systems.
- Performing Depot and Intermediate Maintenance Activity (IMA) repair, maintenance and overhaul.
- Performing upgrade, conversion and modification of hardware.
- Performing maintenance and issue of approved hardware and software baselines.
- Supporting Production Engineering and Manufacturing of out-of-production replacement components for mature systems.
- Performing ILS, Supply, and Fleet Support.
- Supporting Off-Line test equipment.
- Conducting Technical Data Systems operation and maintenance.
- Conducting weapon performance, radiated noise, and acoustic data acquisition and analyses for production acceptance and R&D.
- Providing in-service engineering support to undersea weapons and targets depots and Fleet lightweight torpedo and target IMAs.
- Developing, maintaining, and operating production acceptance land-based test facility.
- Developing depot procedures and test program sets.
- Developing, maintaining and operating facilities for conducting environmental stress testing of pre-production and periodic hardware.
- Conducting quality evaluation programs for deployed weapons.
- Performing Flexible Computer Integrated Manufacturing (FCIM) engineering for USW applications.
- Performing ILS for in-service systems.
- Supporting Robotics engineering for USW maintenance applications.
- Providing Technical Data Packages (TDPs) for spares procurement.
- Procuring, assembling and installing upgrade kits for Fleet off-line test equipment.

- Evaluating vendor performance against specifications, including physical configuration audits and pre-production, periodic and functional testing.
- Providing technical support for FMS consistent with above roles.

(b) Ranges

A representative sample of the Keyport Division responsibilities and capabilities in this area are:

- Range Support for RDT&E testing on Pacific Ranges.
- Range Support for RDT&E testing and proofing on Northwest Ranges.
- Development, maintenance and operation of Northwest Ranges.
- Maintain and operate Pacific area and North Atlantic Treaty Organization (NATO) ship combat systems test sites (e.g., Surface Ship Radiated Noise Measurement (SSRNM), FORACS I and III, SESEF).
- Operate full-spectrum range support instrumentation for acoustic and E- and B- field measurements.
- Develop, maintain and operate systems designed for bottom search and recovery of USW torpedoes and targets for Northwest Ranges.
- National UUV Test and Evaluation Center (NUTEC).
- Portable range and acoustic system development, deployment, operation and analyses.

(c) Submarine SONAR and Combat Systems; Surface Ship SONAR ASW Systems and Arctic Program Coordination

A representative sample of the Keyport Division responsibilities and capabilities in this area are:

- Performing Manufacturing Engineering and Manufacturing of out-of-production. replacement components for mature systems.
- Providing spares hardware support.
- Providing supply support.
- Performing Depot and IMA repair and overhaul.
- Conducting Technical Manual and Production Engineering Drawing Maintenance.
- Providing Packaging, handling, shipping and transportation support.
- Providing production technical data packages for assigned systems.
- Developing depot and IMA procedures and test program sets (e.g., for Consolidated Automated Support System (CASS), etc.).
- Procuring, assembling, and affecting depot installation of Ordnance Alterations (ORDALTs), Ship Alterations (SHIPALTs), Machinery Alterations (MACHALTs), Temporary Alterations (TEMPALTs) and Alteration Equivalent to Repair (AER) kits and Engineering Changes (ECs).

- Providing engineering in support of repair and overhaul at component, module, and system level for assigned equipment such as CV/TSC (Carrier Based Tactical Support Center) and TWCS (Tomahawk Weapons Control System).
- Providing Arctic ice camp, field station, and tracking range operational support.
- Providing coordination and submarine on-board pilot services for Arctic exercises.
- Providing technical support for FMS consistent with above roles.
- Distance Support and e-supportability such as the Remote Technical Assistance Support System (RTASS) and the Technical Data Knowledge Management (TDKM) Program.

(d) Operational Testing

A representative sample of the Keyport Division responsibilities and capabilities in this area are:

- Commander Operational Test and Evaluation Force (COMOPTEVFOR) principal Trusted Agent for USW Systems .
- Ship ASW systems testing (e.g., SSRNM, FORAC, CSSQT, SESEF, WSAT) for Pacific ranges.
- Fleet ASW exercise reconstruction and analyses for Pacific range operations.

2.1 Keyport Division Detachments, Remote Offices, Other Supported Activities and Ranges

- NUWC Detachment, San Diego, CA.
- NUWC Detachment, Lualualei, HI.
- NUWC Detachment, Hawthorne, NV.
- National UUV Test and Evaluation Center (NUTEC), Keyport, WA.
- Fleet Test Range, Nanoose, BC Canada.
- 3D Tracking Range, Dabob Bay, WA.
- Shallow Water Range, Quinault, WA.
- Shipboard Electronic Systems Evaluation Facility (SESEF), Ediz Hook WA.
- Shipboard Electronic Systems Evaluation Facility (SESEF), San Diego, CA.
- Shipboard Electronic Systems Evaluation Facility (SESEF), Hawaii.
- Fleet Operational Readiness Accuracy Check Site (FORACS), Hawaii.
- Fleet Operational Readiness Accuracy Check Site (FORACS), AUTEC.
- Fleet Operational Readiness Accuracy Check Site (FORACS), San Clemente, CA.
- Fleet Operational Readiness Accuracy Check Site (FORACS), NATO.
- Other Activities Supported include NAVAIR, Naval Supply Systems Command (NAVSUP), Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP), SPAWAR, COMOPTEVFOR, ONR, Office of Naval Intelligence (ONI), Defense Logistics Agency (DLA), Naval Weapons Station Yorktown, Naval Weapons Station Indian Island, Naval Magazine Pearl Harbor, United States Customs Service, DoD Counter Drug Office, United States Army Environmental Center, and the USAF.